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The AUTOMOBILE

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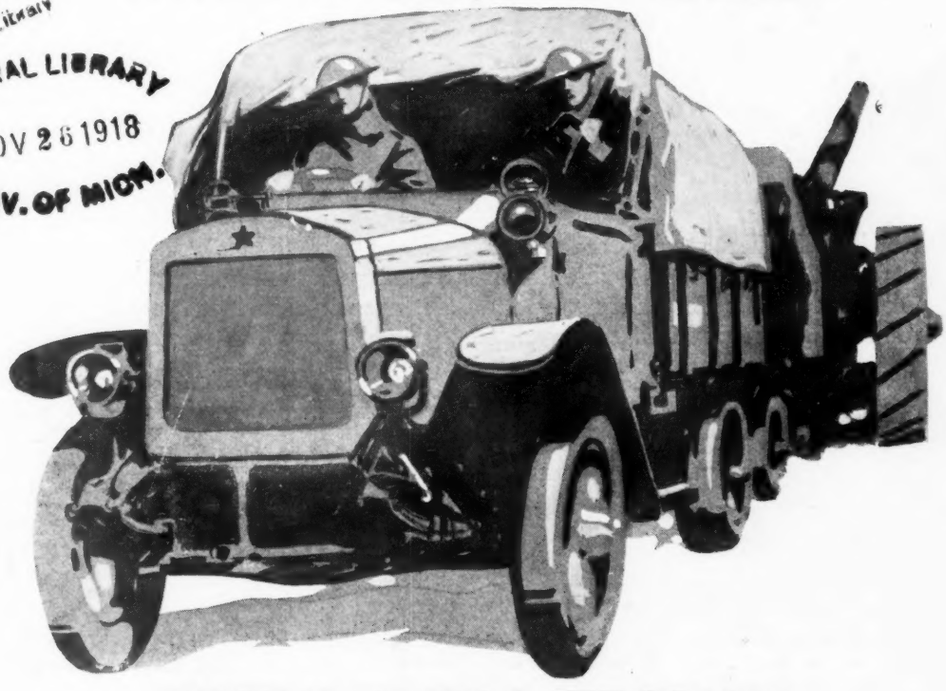

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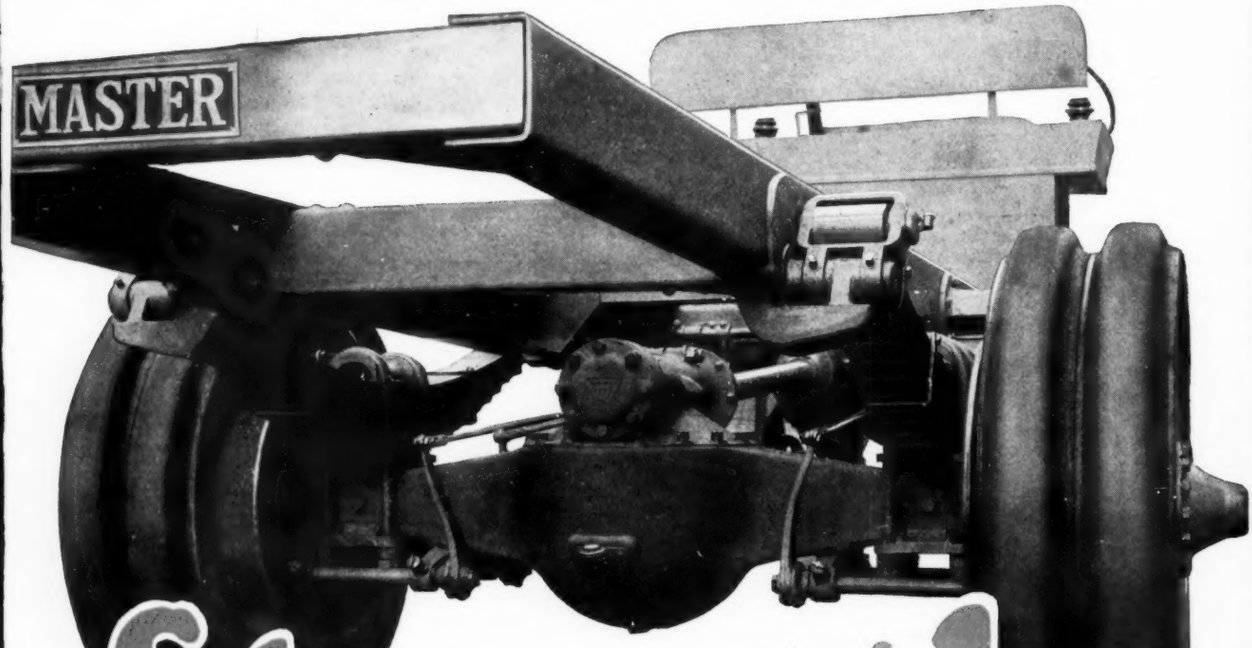

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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XXXIX NEW YORK, THURSDAY, NOVEMBER 14, 1918—CHICAGO No. 20

50% Increase in Production Permitted

War Industries Board Reduces Restriction on Car, Truck and Tractor Output One-Half—Truck Makers Released from Pledge to Sell Essential Industries and Can Now Get Steel for 100% Production

DEMOBILIZATION NOT TO BRING DEMORALIZATION OF LABOR

Demand for War Materials Likely to Continue for Some Time—Gradual Disbanding of Army Planned—Makers Calmly Prepare for Return to Peace Conditions

WASHINGTON, Nov. 12.—Production restrictions imposed by the War Industries Board have been lifted by 50 per cent insofar as the remainder of the year is concerned, *and it is expected that with the beginning of the new year all restrictions of every nature will be eliminated and that normal peace-time industrial activities will be resumed in full.*

Passenger car manufacturers can produce 75 per cent of their total production in the last 7 weeks of 1917 during the last 7 weeks of this year.

Motor truck manufacturers can produce 100 per cent of their production for November and December, 1917, during the last remaining weeks of this year.

Farm tractor manufacturers who produced 100 or more tractors in the year preceding Sept. 30, 1918, can turn out 75 per cent of their production in the year ending Sept. 30, 1919. Farm tractor makers who produced 10 or more tractors in the year preceding Sept. 30, 1918, can produce not over 100 tractors in the year ending Sept. 30, 1919. Similarly tractor makers who made less than 10 tractors in the year preceding Sept. 30, 1918, can turn out 20 tractors in the year ending Sept. 30, 1919.

Motorcycle manufacturers whose production has been restricted to 75 per cent for the last 4 months of this year compared with that period of 1917 can produce 87½ per cent of the production of the last 7 weeks of 1917 during the remainder of 1918.

Automobile tire production, which was curtailed 50 per cent, can proceed during the remaining weeks of this year at 75 per cent of the output for the corresponding period.

All of those industries which had been curtailed, states the War Industries Board in its announcement, can decrease their curtailment as fixed for the last 4 months of this year by 50 per cent for

the remainder of 1918. This percentage gives the figures stated above as the production figures for the remainder of the year.

For example, passenger car manufacturers were restricted to a production for the last half of 1918 of 25 per cent of the full production of 1917. This meant a production during the last 6 months of 1918 to 50 per cent of the output of the similar period of 1917. Consequently by reducing this curtailment by 50 per cent for the remainder of this year in accordance with the announcement of the War Industries Board there is a production cut of 25 per cent instead of 50 per cent allowing manufacturers to produce on a 75 per cent basis until January 1, 1919.

All rules, regulations and conservation measures devised by the conservation division of the War Industries Board will be continued in full. This means that the plans for reducing the numbers of sizes of pneumatic tires, truck tires and farm plows and the elimination of the uses of certain materials in motorcycles will continue.

Trucks on 100% Basis

Although trucks are not specially mentioned, the Automotive Section of the War Industries Board announced officially to-day that makers can consider themselves on a 100 per cent basis.

The clauses in the announcement to the effect that wholesale and retail dealers are relieved from their pledges to sell to essential consumers only and that makers are no longer required to obtain pledges from distributors, are said by the Automotive Section of the Board, to place the truck industry on 100 per cent output. The pledges which were given by manufacturers to conform to the allotment provided by the Automotive Section have not been terminated but will be shortly.

These pledges, however, should not stand in the way of 100 per cent production of any maker, said the Automotive Section to-day, as the allotments granted, it was said, were up to and over the 100 per cent production of the 18 months preceding July 1, 1918.

Can Supply All Truck Demands

It was pointed out to the representative of AUTOMOTIVE INDUSTRIES that in fixing these allotments where makers had met with adverse conditions in 1917, the production of the first six months of 1918 was used as the basis, and where makers had started in business since July 1, 1918, their facilities for manufacture and the stock on hand of parts and materials were used as a basis.

This arrangement would assure a liberal allotment. According to the reports received on truck production and stock on hand by the Automotive Section, manufacturers will be able to meet all demands for trucks during the remainder of the year.

Such in brief is the latest ruling of the War Industries Board, given to the industrial world immediately following the signing of the armistice with the Central Powers.

Not only is the production of cars, trucks, tractors and motorcycles permitted to increase by 50 per cent over the previously allowed output, but all restrictions covering the sale of trucks to what have been termed essential industries also are removed, thus permitting makers to sell to capacity to every trade.

The removal of this restriction automatically removes the restriction placed upon steel makers who heretofore have been compelled to furnish steel only for essential uses but who now can sell truck makers all the steel they require.

Priority Assistance Assured

Furthermore, the Priorities Division also announces that it will assist all industries insofar as it is possible by means of priorities to secure the materials that will make for normal business, but priorities will be particularly given for the supply of the army and for the production of food, gas, oil, clothing, minerals and for aiding public utilities.

At the same time comes word that all official objection to shows has been withdrawn.

The National Automobile Chamber of Commerce is at present considering the matter of holding the National expositions in New York and Chicago and the sentiment is that if the various manufacturers can prepare sufficient models for them they will be held.

Manager Sam Miles states that it is necessary to take a mail vote of members and that if they are favorable to shows, as they were before the ban was placed on them, they will be held.

In this event, and in view of present conditions it is probable that the Chicago show would be held first, in the Coliseum as usual, with the New York show later and likely in Madison Square Garden.

May Continue Shows

Consideration is being given the possibility of holding dealer shows as well. The National Association of Show Managers, representing local exhibitions all over the country, has called an early meeting to be held in Cleveland, at which the question will be threshed out.

The War Industries Board has also removed all restrictions as regards the construction of Federal, State or Municipal highways, roads, bridges, etc., and for the development of mines including oil and gas wells. The order decreasing the amount of curtailment also applies to all agricultural implements, road making machinery, oil and gas consuming devices and all other commodities which have been restricted in output.

Non-war building construction is now allowed to a certain extent and any structures or additions or repairs not costing over $10,000 can be made without permits while those not costing over $25,000 can be made if a permit is secured from the State Council of Defense. Any building begun prior to September 3, 1918, and which has substantially developed can be completed without permit.

Dealers in raw materials and semi-finished and finished products are released completely from all of the pledges they have made to the Priorities

Division as regards the sale and distribution of the commodities they handle.

The Revenue Bill which is still in the hands of the Senate Finance Committee, it is now expected in view of the armistice will probably be reduced importantly in part. Nothing definite has been announced as yet, however, as regards the reduction of the contemplated taxes on automobiles, trucks, motorcycles and gasoline.

Thus, the first question of the industrial world as to what resumption of normal industry will be allowed has been answered promptly by the War Industries Board.

The Fuel Administration up to this time has announced no relaxation from the restrictions it imposed on non-war industries and in fact has stated that no immediate reduction of the Government program for production or conservation of coal or oil during the winter will follow the signing of the armistice terms. Cessation of hostilities will unquestionably relieve the demand for bituminous coal, however.

Complete Text of War Industries Board Ruling

All of the rules, regulations, restrictions and directions embodied in orders and circulars issued by the Priorities Division of the War Industries Board are continued in effect subject to the following modifications:

SECTION 1.

Section 5 of revised Circular 21, issued by this division as of date Oct. 15, 1918, dealing with non-war construction is hereby amended so as hereafter to read as follows:

Section 5—Construction projects not requiring permits or licenses from non-war construction section. Construction projects falling within the following classifications are hereby approved, and no permits or licenses will be required therefor from the non-war construction section.

1—Construction projects approved in writing by the Facilities Division of the War Industries Board.

2—All farm and ranch buildings, structures or improvements.

3—All buildings, structures, roadways, plant facilities or other construction projects of every nature whatsoever, undertaken by the United States Railroad Administration, or by any rail or water transportation company, organization or utility (whether or not under the direction of such administration) or by the American Railway Express Company, or by the owner or operator of any telegraph or telephone line.

4—The construction, maintenance, improvement or development by Federal, State or municipal authorities of highways, roads, boulevards, bridges, streets, parks and playgrounds.

5—The construction, extension, improvement, maintenance or repair of any public utility, including water supply systems, sewer systems, light and power facilities and street and interurban railways.

6—The construction, extension or repair of all irrigation and drainage projects.

7—Construction projects connected with the extension, expansion or development of mines of every character whatsoever or connected with the production and refining of mineral oils and of natural gas.

8—The construction, alteration or extension, or repairs or additions to plants engaged principally in producing, milling, refining, preserving, refrigerating or storing foods and feeds.

9—The construction of new or the alteration or extension of existing schoolhouses, churches, hospitals and Federal, State or municipal buildings involving in the aggregate a cost not exceeding $25,000.

10—The construction of new buildings or structures not embraced in any of the foregoing classifications, or the repairs or additions to, or alterations or extensions of, existing buildings or structures, in either case involving in the aggregate a cost not exceeding $10,000.

11—The construction of new buildings or structures not embraced in any of the foregoing classifications, or the repairs or additions to, or alterations or extensions of, existing buildings or structures, in either case involving in the aggregate a cost not exceeding $25,000; when approved in writing by the State Council of Defense or its duly authorized representatives.

12—Buildings begun prior to Sept. 3, 1918, where a substantial portion of the building has already been constructed.

Building Material Production

SECTION 2

All limitations on the production of building materials, including brick, cement, lime, hollow tile and lumber, are hereby removed, and the materials so produced may be sold and delivered for use in connection with any building project for which no permit or license is required under Revised Priority Circular 21, as further revised by Section 1 hereof, or to any project authorized by permits or licenses issued in pursuance of said circular. All limitations upon the production or use of lime or crushed or pulverized limestone in any form for agricultural uses are hereby removed.

SECTION 3

Restrictions upon industries and manufacturers in their production, or in their consumption of materials for commodities hereafter in this section enumerated, as such restrictions are expressed in orders and circulars issued by this division, are hereby so modified that such restrictions for the respective periods provided for in such several orders and circulars shall be less than the restrictions to the extent of 50 per cent of such restrictions. The commodities referred to are as follows:

1—Agricultural implements and farm operating equipment, including tractors.
2—Road machinery.
3—Coal, coke and wood-burning cooking and heating stoves and ranges.
4—Gas ranges, water heaters, room heaters, hot plates and appliances.
5—Oil and gasoline heating and cooking devices.
6—Electrical heating and cooking devices and appliances.
7—Black galvanized and enameled ware and tin plate household utensils.
8—Refrigerators.
9—Ice cream freezers.
10—Washing machines.
11—Clothes wringers.
12—Family sewing machines.
13—Electric vacuum cleaners.
14—Metal beds, cots, couches, bunks and metal springs for same.
15—Boilers and radiators.
16—Baby carriages.
17—Corsets.
18—Bicycles.
19—Electric fans (including motors).
20—Builders' hardware.
21—Padlocks.
22—Stepladders.
23—Scales and balances.
24—Rat and animal traps.
25—Talking machines (including motors and accessories).
26—Talking machine needles.
27—Clock-watches and clocks.
28—Watch movements and watch cases.
29—Hand stamping and marking devices.
30—Safes and vaults.
31—Lawn mowers.
32—Pottery.
33—Pocket knives and similar products.
34—Linoleum.
35—Rag felt floor covering.
36—Sporting goods.
37—Glass bottles and glass jars.
38—Tin plate.
39—Pianos, including piano players, automatic pianos and parts.
40—Pneumatic automobile tires.
41—Passenger automobiles.
42—Cash registers.

Nothing herein contained shall be construed to release any industry or manufacturer from the strict observance of the rules and regulations of the Conservation Division of the War Industries Board as applicable to such industry or manufacturer.

SECTION 4

Dealers (wholesale and retail) in raw materials, semi-finished and finished products are hereby relieved from the obligation to give and require pledges relating to such commodities, notwithstanding any provision for pledges in any order or circular heretofore issued by the Priorities Division, and notwithstanding any stipulation in any pledge that they will require pledges from those who buy from them for resale; provided, however, building materials and other products shall not be sold and delivered for use in connection with any non-war construction projects save those for which no permit or license is required under priority circular No. 2, as revised by Section 1 hereof, or with the terms of orders and circulars heretofore issued, and comply with all pledges heretofore or hereafter given, save that they are hereby relieved from the provisions in such pledges as require manufacturers to exact pledges from those who buy them for resale.

SECTION 5

The Priorities Division of the War Industries Board will, as far as practicable, assist industries in procuring materials, fuel, transportation and labor to enable them to increase their operations to normal limits as rapidly as conditions may warrant. Precedence must, however, be given to stimulate and increase the production of cargo ships and supply the requirements of the Army and Navy of the United States, as well as to provide for this nation's proper proportion of the enormous volume of materials, equipment and supplies as have been required for the reconstruction and rehabilitation of the devastated territories of Europe. Precedence must also be given to such activities as will tend to stimulate the production of foods and feeds, of coal, of natural gas, of oil and its products, of textiles and clothing, and of minerals; and to provide for deferred maintenance, additions, betterments, and extensions of railroads, telegraph and telephone lines and other public utilities, and to permit and stimulate the intensive development of inland waterways.

The War Industries Board has advised manufacturers of woolen sweaters and similar articles that the tentative schedule issued by the Conservation Division for the restrictions of the variety of their products would not be put into effect.

War Work Contracts Not to Be Cut Short

Pershing's Requirements Likely to Be Heavy for Months—Contracts for Future Production First to Go

By Allen Sinsheimer

WHAT will the United States do with unfinished war contracts? The armistice found the War Department totally unprepared for peace, and cablegrams are passing between here and the American Expeditionary Forces constantly this week to determine which war activities must be continued for the present, which can be gradually curtailed and which can cease at once. Conferences are also being held, and it is expected that definite news on this subject will be made public shortly.

Ninety per cent of the war contracts contained cancellation and termination clauses allowing for "termination in the public interest" by which payments will be made by the Government in the event of termination of the contracts for articles completely manufactured at the time and for raw materials, articles in process of manufacture and the contractor's outstanding obligations incurred in good faith in connection with the performance of the contract.

Provision is also made for payment by the Government on account of depreciation of plants and equipment. In return the Government is released from the obligation to take the remaining articles, not manufactured, specified in the contract and to pay anticipated profits to the contractor on the unfinished portions of the contract.

It is expected that all of these contracts which should be terminated in the public interest will be, and that the manufacturers will be satisfied with the decisions of the Board of Contract Adjustment which settles the amounts due the contractors.

In those contracts without cancellation or termination clauses and which the Government may desire to turn back, it is expected that the contractors will also be satisfied with a settlement made on the basis of the provisions contained in those contracts which have termination clauses as stated above.

For a precedent in this matter the Government has the practice which followed the Civil War. At that time the contracts had no cancellation clauses but all were cancelled and contractors were forced to the Court of Claims, at which they met with little success. They have this same option to-day if they are dissatisfied with the findings of the Board of Contract Adjustment or the Secretary of War, to whom those findings can be appealed.

The delay in curtailment of war activities is caused by the ignorance of the authorities in this country of the desires of General Pershing. The Motor Vehicle Section of the Quartermaster Department anticipates, however, that it will completely cancel the last order for 25,000 B trucks which was placed recently and will take all of the preceeding order for 8000 of these trucks, which is now about 50 per cent completed. It is expected that the orders for the A and the AA trucks which were recently started on by the manufacturers will be reduced from 40 to 60 per cent, depending on the needs of the Motor Transport Corps of the A. E. F. The contracts placed with the Packard company for 4000 Militor tractors will be recalled. Similarly, the Ordnance Department engaged in tractor production and the Bureau of Aircraft Production which controls the output of airplanes are taking steps to reduce production, but neither of these departments have yet reached definite decisions.

The War Industries Board and the Fuel Administration are both temporary departments created for the duration of the war, and they retain authority until peace is formally proclaimed.

At present a committee appointed by President Wilson is investigating conditions to ascertain whether these departments should be continued by congressional legislation following the declaration of peace, or whether they should be merged with the respective established Government bureaus, the Fuel Administration, for example, merging with the Department of the Interior, or if a reconstruction committee should be formed to take over the work of these departments or if possibly the Council of National Defense which is a permanent department can assume the more important functions which they give up with the relinquishment of their authority.

The War Trade Board, which is also a temporary department and which may delegate its work to the Department of Commerce, announces that for the present the control exercised over imports and exports will con-

tinue indefinitely to assure shipping space for the constant flow of supplies for the American and Allied forces which will be required for many months to come and to prevent the flooding of the United States with foreign orders which would strip this country of its immediate available commodities and which would come with any lifting of the present embargoes.

In view of the permanency of the Council of National Defense, which department was created prior to the war and, by the bill creating it, can continue after, it is expected that the Highways Transport Committee which is a part of the Council will be continued and will operate on a broader scope than heretofore, working particularly with the Food Administration and the United States Shipping Board, developing roads to facilitate food production and distribution and its delivery to the ships for overseas consumption.

Work for All

The Motor Transport Corps also recently organized in the army is expected to continue with increasing importance for the time being, as the overseas forces will operate their motor vehicles widely as heretofore and the M. T. C. controlling operations and maintenance will continue this work. The Motor Vehicle Section of the Quartermaster Department, purchasing motor vehicles, will likely discontinue or be reduced importantly as soon as the production and procurement of the remaining vehicles necessary for the army is completed.

Plans for control of labor following demobilization include a scheme for "demobilization for peace as we mobilized for war." This means that the men to be first released from the army will be those who are the heads of families or who are skilled workers necessary to peace time industries.

It is also planned to use the Department of Labor Community Boards to bring employers and workers in contact.

"It is clear that there is work enough," said Secretary of War Baker to-day, "in the United States for all the labor in the country. Many Government activities like the ship building industry will continue uninterruptedly and others will gradually be readjusted."

It was further stated that there should be no fear of keen competition and surplus of labor caused by the demobilization because these men will be distributed to their own localities and can thus be quickly assimilated by local industries.

Manufacturers who have been in Washington in the past few days state that they are trying to retain as much of their war work as possible until they can gradually change their equipment from a war to a peace basis and thus by the continuing operations hold their labor organizations together and be ready for large peace production when all conditions allow it.

The work of reclaiming the vast amounts of materials and supplies in plants will be carried out by the War Department in co-operation with the War Industries Board. A considerable part of the material, including particularly motor vehicles, will be disposed of abroad, while those remaining will be brought back to the United States. The Belgian Government is negotiating now for the purchase of American Army trucks and automobiles in France.

No Labor Flood Expected with Demobilization

Army to Be Released Not Faster Than Places Open for Men—Europe Will Have Enormous Labor Demand

THERE is no idea in industry that an overnight change will have to be made from war to peace work. Under the direction of a wise government which fully realizes the problems of labor and materials involved in shifting from one kind of manufacturing to another, it is confidently expected that changes will be so gradual that no chaos will result. Manufacturers will immediately start work to secure peace business. They will begin to build up their sales organizations, which have been depleted since war compelled an abandonment of peace production.

One of the fears which has been expressed frequently but which on careful analysis appears absolutely groundless, is that the country will be flooded with labor due to the demobilization of the army. There is a pent-up demand for labor in such fields as building and a great many others which have been temporarily classified as non-essential from a war standpoint.

This demand alone will absorb all of the army which can possibly be released during the coming nine or ten months. The Labor, War and Navy Departments and the War Industries Board are determined not to disband the army any more rapidly than employers find places for the men. The War Industries Board has sent questionnaires to employers in all industries asking the needs of each for men and in other ways is seeking to secure an accurate knowledge of labor demand.

It is very probable that the War Department will take advantage of the machinery used in the draft to assist in systematic demobilization. In fact, it has already been suggested that General Crowder be put in charge of the task of preserving the proper labor balance during demobilization operations. It must not be forgotten that a considerable army will have to be maintained in France or elsewhere in Europe pending final peace negotiations, and the great work of policing and reconstruction.

Andre Tardieu, General Commissioner for Franco-American war affairs, has already appealed to the United States for aid in rebuilding France. This is only a first suggestion of the fact that in spite of the vast armies which will be demobilized, the world will be short of manpower to undo the damage of the past four years. France alone has lost 2,500,000 men. In other words, 1/15 of her population is missing at the very time when all her resources are necessary for rebuilding, and these men who are lost represent the youngest and strongest of the nation.

The war expenditure of France, 120,000,000,000 Francs, is a heavy burden on the shoulders of this nation. Unhappily, the territories which have been invaded were the wealthiest of France, and although in area they did not exceed 6 per cent of the total country, they paid 25 per cent of the total taxes. There have been 350,000

homes destroyed, and it will require 600,000,000 days of work to rebuild them, without considering the inside furnishing.

Some knowledge of the need for farm tractors and other mechanical implements in France to take the place of what has been lost, may be gained from the fact that 454,000 machines and carts of an agricultural nature have been destroyed. The loss in horses and cattle amounts to over 1,500,000. These items have a valuation of approximately $1,200,000,000.

The valuation of other industrial material from the invaded region as compared with the total resources of France may be gained from the figures of 1913, when it amounted to 94 per cent of the total divided as follows: Flax for spinning, 90 per cent; iron ore, 90 per cent; pig iron, 83 per cent; steel, 70 per cent; sugar, 70 per cent; cotton, 60 per cent; coal, 55 per cent; electric power, 45 per cent. Of all this, the plants, machinery, mines and so forth have been totally destroyed.

To reconstruct over 2,000,000 tons of pig iron and nearly 4,000,000 tons of steel alone will be required. The raw material alone required to build up what has been destroyed will total $10,000,000,000. France needs America's help in this.

Makers Plan Return To Peace Basis

Demand For War Materials Will Continue Some Time—Few Cancellations for Future Deliveries

DETROIT, Nov. 12—Detroit automobile manufacturers are not greatly concerned over switching back from war production to peace-time outputs. While every company expects cancellations from Washington, the various officials do not believe these will come all at one time.

The consensus of opinion among the automobile men is that war-time production will go on unabated for a time and that when the allied governments see what turn things are going to take in Europe preparation will be made for the cutting out of war work. This will be tapered off in a manner that will permit the manufacturers to change over gradually to production of passenger and commercial vehicles.

Few Cancellations Received

Not a single company, as far as is known at this time, has received a cancellation from Washington, except on far distant future deliveries. An order was received and put into effect about 10 days ago cutting out all overtime work in the plants and building operations where plant extensions for war work were being made.

The manufacturers are a unit in the belief that no industrial depression will occur during the time the industry is getting back to normal. With the great demand for cars and trucks that is bound to come they figure their shops will be working full time and at top speed at an early date after peace is concluded.

Await Government Action

Future plans for the automobile industry will depend entirely on the action of the Government, according to C. D. Hastings, vice-president of the Hupp Motor Car Corp. Hupp production of war materials is going on as usual, the only changes ordered by the Government being elimination of overtime work and cessation of all building operations on plant extension.

"Whatever we hear now is only gossip," said Mr. Hastings, "for the officials in Washington, I do not believe, know just what will be done as yet. There have been a great many contracts cancelled, but in our opinion war work will be cut down gradually to allow for the change over to automobile manufacturing. With cancellation of war contracts spread over a fair period of time there should be no industrial depression.

"Our company could begin the manufacture of automobiles to-morrow, if permitted to do so. Going back to production of motor cars will depend entirely on what the Government allows us in the way of materials, and I do not think there will be much of a change before January 1. It is likely we will know shortly after the beginning of the New Year what is to be done."

The Ford Motor Co., which is perhaps doing more war work than any other automobile company, is going ahead with the production of war materials. F. L. Klingensmith, treasurer, said: "We are going right on with all our war business. Our production is just as great this week as last, and until the Government instructs us to cease manufacturing we will go on as usual."

Maxwell Continues Production

"There has been no stoppage in our production as yet," said Walter E. Flanders, of the Maxwell Motor Co., Inc. "We will have to do whatever the Government tells us, but as yet we have had no instructions. Cutting out war contracts now would force us to lay off all our factory employees. It is too early yet to tell what will happen."

No cancellations of war contracts have been received to date by the Paige-Detroit Motor Car Co., H. M. Jewett, president, announces. The Government cannot afford to cancel all contracts simultaneously, Mr. Jewett says, for the reason that chaos would result instantly.

"War production will be reduced gradually," Mr. Jewett asserted, "and in this way the industries will be kept busy and materials already on hand can be used up. Otherwise these materials would be a tremendous loss to the Government. All the trucks and tractors now in France and those in the process of manufacture will be needed in the reconstruction work in northern France and Belgium. This will leave a great demand for the same machines in this country, so that the various companies will go quickly into large production at the earliest possible moment.

Depend Upon Supplies

"We are building automobiles now and plan to gradually increase our output, according to the availability of steel and other supplies. I believe all the manufacturers doing war work will follow a similar plan and thereby get quickly back to peace-time production. The steel now going into war equipment will be sufficient to take care of car and truck production.

"An enormous building program has been held up on account of the war and this will have to be taken care of. It means the employment of thousands of men and the use of a large amount of material. We look for everything to run as smoothly as though there had never been a change in manufacturing."

Extracts from Von Richthofen's Diary

Famous German "Ace" Was Credited with Having Shot Down Eighty-Two British and French Airplanes—He Commanded the Famous "Flying Circus"

PART I

CAPTAIN BARON VON RICHTHOFEN

EDITOR'S NOTE.—*Rittmeister Freiherr Manfred von Richthofen was considered the greatest pilot of the German army. He accounted for eighty-two enemy machines before meeting his death at the hands of a British airman in May,* 1918.

On his body was found a personal letter from the German army commander of the Somme area urging him to lead his squadron for at least one reconnaissance despite the fact that British aerial superiority had become so evident that scouting was attended by almost insuperable difficulties. He was buried by his enemies with full military honors as a gallant fighter and a worthy antagonist.

My First Solo-Flight

THERE are some moments in one's life which tickle one's nerves particularly, and the first solo-flight is among them. One evening my teacher, Zeumer, said: "Now go and fly by yourself." I must candidly confess that I felt like replying, "I am afraid," but this is the word which should never be used by a man who defends his country, therefore, whether I liked it or not, I had to swallow it and get into the machine. Zeumer explained to me once more every movement in theory.

This Fokker triplane is supposed to be the machine which von Richthofen was using when brought down by a single bullet through the heart

I scarcely listened to his explanation, for I was firmly convinced that I should forget half he was telling me. I started the machine. The aeroplane went the prescribed speed, and I noticed when I had left the ground. After all, I did not feel timorous, but rather elated. Now I did not care for anything. I would not have been frightened whatever had happened. Scorning death, I made a large turn to the left, stopped the engine near a tree, exactly where I had been ordered to do so, and looked forward to what would happen. Now came the most difficult thing, the landing. I remembered exactly the movements I had to make. I acted mechanically and the machine moved quite differently from what I had expected. I lost my balance, made some wrong movements, turned a cartwheel on hitting the ground, and succeeded in converting my machine into a battered mess of wreckage. I was very sad, looked at the damage I had done to the machine, and had to suffer from other people's jokes.

I Leave Russia for France

The August sun was almost unbearably hot on the sandy flying ground at Kovel. While we were chatting among ourselves one of my comrades said: "To-day the great Boelcke is coming on a visit to us, or rather to his brother!" In the evening the great man duly arrived. He was vastly admired by all, and he told us many interesting things about his journey to Turkey. He was just returning from Turkey, and was on the way to Headquarters. He imagined that he would go to the Somme to continue his work. He was to organize a fighting squadron. He was empowered to select from the Flying Service those men who seemed to him particularly qualified for his purpose.

I did not dare to ask him to be taken on. I did not feel bored by the fighting in Russia. On the contrary, we made extensive and interesting flights. We bombed the Russians at their stations. Still, the idea of fighting again on the Western Front attracted me. There is nothing finer for a young cavalry officer than the chase in the air.

The next morning Boelcke was to leave us. Quite early somebody knocked at my door, and before me stood the great man with the "Ordre pour le Mérite." I knew him, as I have previously mentioned, but still I had never imagined that he came to look me up in order to ask me

A German photograph showing the end of Immelmann, one of their star airmen. He had a long list of victories

to become his pupil. I almost fell on his neck when he inquired whether I cared to go with him to the Somme.

Three days later I sat in the railway train and traveled through the whole of Germany straight away to the new field of my activity. At last my greatest wish was fulfilled. From now onward began the finest time of my life.

At that time I did not dare to hope that I should be as successful as I have been. When I left my quarters in the East a good friend of mine called out after me: "See that you do not come back without the 'Ordre pour le Mérite.'"

Major Hawker

I was extremely proud when one fine day I was informed that the aviator whom I had brought down on the 23rd of November, 1916, was Major Hawker, the English Immelmann.

In view of the character of our fight, it was clear to me that I had been tackling a flying champion.

One day I was blithely flying to give chase when I noticed three Englishmen who also had apparently gone a-hunting. I noticed that they were interested in my direction, and as I felt much inclination to have a fight I did not want to disappoint them.

I was flying at a lower altitude. Consequently I had to wait until one of my English friends tried to drop on me. After a short while he came sailing along and wanted to tackle me in the rear. After firing five shots he had to stop, for I had swerved in a sharp curve.

The Englishman tried to catch me up in the rear while I tried to get behind him. So we circled round and round like madmen after one another at an altitude of about 10,000 feet.

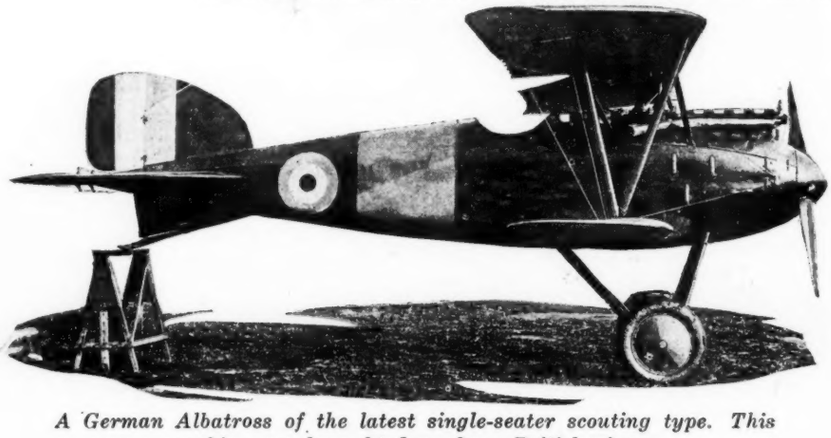
First we circled twenty times to the left, and then thirty times to the right. Each tried to get behind and above the other.

Soon I discovered that I was not meeting a beginner. He had not the slightest intention to break off the fight. He was traveling in a box which turned beautifully. However, my packing case was better at climbing than his. But I succeeded at last in getting above and beyond my English waltzing partner.

When we had got down to about 6000 feet without having achieved anything particular, my opponent ought to have discovered that it was time for him to take his leave. The wind was favorable to me, for it drove us more and more toward the German position. At last we were above Bapaume, about half a mile behind the German front. The gallant fellow was full of pluck, and when we had got down to about 3000 feet he merrily waved to me as if he would say, Well, how do you do?

The circles which we made around one another were so narrow that their diameter was probably no more than 250 or 300 feet. I had time to take a good look at my opponent. I looked down into his carriage and could see every movement of his head. If he had not had his cap on I would have noticed what kind of a face he was making.

My Englishman was a good sportsman, but by and by the thing became a little too hot for him. He had to decide whether he would land on German ground or whether he would fly back to the English lines. Of course he tried the latter, after having endeavored in vain to



A German Albatross of the latest single-seater scouting type. This machine was brought down by a British airman

escape me by loopings and such tricks. At that time his first bullets were flying around me, for so far neither of us had been able to do any shooting.

When he had come down to about 300 feet he tried to escape by flying in a zig-zag course, which makes it difficult for an observer on the ground to shoot. That was my most favorable moment. I followed him at an altitude of from 250 to 150 feet, firing all the time. The Englishman could not help falling. But the jamming of my gun nearly robbed me of my success.

My opponent fell, shot through the head, 150 feet behind our lines. His machine-gun was dug out of the ground and it ornaments the entrance of my dwelling.

I Get the "Ordre Pour le Merite"

I had brought down my sixteenth victim, and I had come to the head of the list of all the flying chasers. I had obtained the aim which I had set myself. In the previous years I had said in fun to my friend Lyncke, when we were trained together, and when he asked me: "What is your object? What will you obtain by flying?" "I would like to be the first of the chasers. That must be very nice." That I should succeed in this I did not believe myself. Other people also did not expect my success. Boelcke is supposed to have said, not to me personally—I have only heard the report—when asked: "Which of the fellows is likely to become a good chaser?" "That is the man!" pointing his finger in my direction.

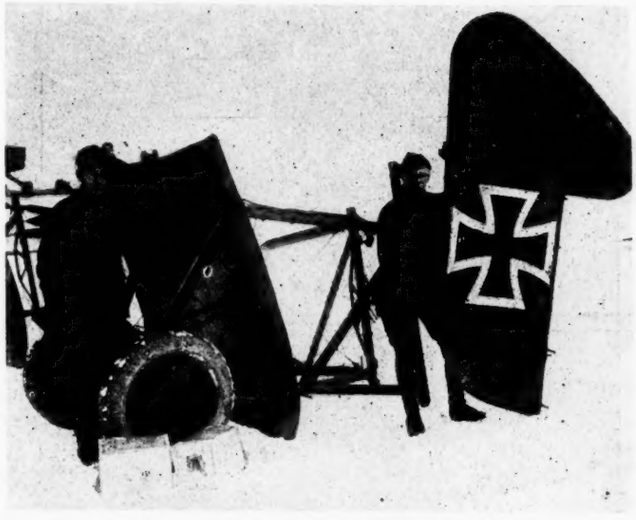
Boelcke and Immelmann were given the Ordre Pour le Mérite when they had brought down their eighth aeroplane. I had downed twice that number. The question was, What would happen to me? I was very curious. It was rumored that I was to be given command of a chasing squadron.

One fine day a telegram arrived which stated: "Lieutenant von Richthofen is appointed Commander of the Eleventh Chasing Squadron."

I must say I was annoyed. I had learned to work so well with my comrades of Boelcke's Squadron, and now I had to begin all over again working hand in hand with different people. It was a beastly nuisance. Besides, I should have preferred the Ordre Pour le Mérite.

Two days later, when we were sitting sociably together, we men of the Boelcke's Squadron, celebrating my departure, a telegram from Headquarters arrived. It stated that His Majesty had graciously condescended to give me the Ordre Pour le Mérite. Of course my joy was tremendous. It was balm on my wound.

I had never imagined that it would be so delightful to command a chasing squadron. Even in my dreams I had not imagined that there would ever be a von Richthofen's squadron of aeroplanes.



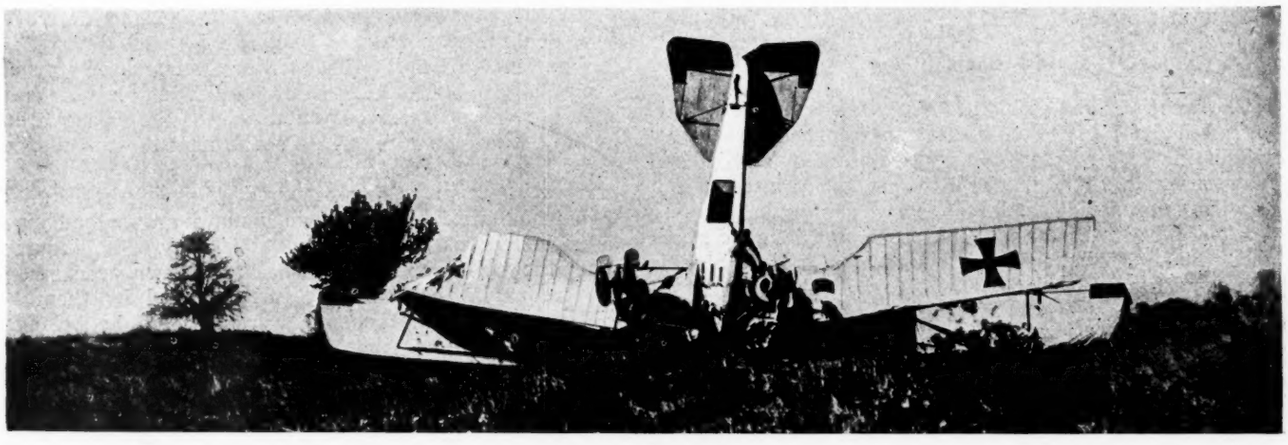
Tail of one of the newest Friedbrichafner machines. The relative size can be gaged from the man who is holding it

English and French Flying*
(February, 1917)

I was trying to compete with Boelcke's squadron. Every evening we compared our bags. However, Boelcke's pupils are smart rascals. I cannot get ahead of them. The utmost one can do is to draw level with them. The Boelcke stäffel has an advantage over my people of 100 aeroplanes downed. I must allow them to retain it. Everything depends on whether we have for opponents those French tricksters or those daring fellows the English. I prefer the English. Frequently the daring of the latter can only be described as stupidity. In their eyes it may be pluck and bravery.

The great thing in air fighting is that the decisive factor does not lie in trick flying, but solely in the personal ability and energy of the aviator. A flying man may be able to loop and do all the tricks imaginable, and yet he may not succeed in shooting down a single enemy.

**This was evidently written when the French air service, although equipped with machines which were the best available at the time, were handicapped somewhat in comparison with that of the Germans. Conditions were very different later on, as has been evidenced by France's practical domination of the air.*



A German plane shot down behind the British lines. The panel seen in the fuselage is used by the gunner in the event of an attack from below

A machine of unknown type brought down by British fliers on the Italian front. It struck the ground with such violence that the undercarriage was torn off and the wings collapsed

In my opinion the aggressive spirit is everything, and that spirit is very strong in us Germans. Hence we shall always retain the domination of the air.

The French have a different character. They like to set traps and to attack their opponents unawares. That cannot easily be done in the air. Only a beginner can be caught, and one cannot set traps, because an aeroplane cannot hide itself. The invisible aeroplane has not yet been discovered. Sometimes, however, the Gallic blood asserts itself. The Frenchmen will then attack. But the French attacking spirit is like bottled lemonade. It lacks tenacity.

In Englishmen, on the other hand, one notices that they are of Germanic blood. Sportsmen easily take to flying, but Englishmen see in flying nothing but a sport. They take a perfect delight in looping the loop, flying on their back, and indulging in other tricks for the benefit of our soldiers in the trenches. All these tricks may impress people who attend a sports meeting, but the public at the battle front is not as appreciative of these things. It demands higher qualifications than trick flying. Therefore, the blood of English pilots will have to flow in streams.

My Record Day

The weather was glorious. We were ready for starting. I had for visitor a gentleman who had never seen a fight in the air or anything resembling it, and he had just assured me that it would tremendously interest him to witness an aerial battle.

We climbed into our packing cases, and laughed much about him. Friend Schäfer thought that we might give him some fun. We placed him before a telescope and off we went.

The day began well. We had scarcely gone to an altitude of 6000 ft. when an English patrol of five machines was coming our way. We attacked them by a rush, as if we were cavalry, and the hostile squadron lay destroyed on the ground. None of our men were even wounded. Of our enemies three had plunged to the ground and two had come down in flames.

The good fellow down below was not a little surprised. He had imagined that the affair would look quite different, that it would be far more dramatic. He thought the whole encounter had looked quite harmless until suddenly some machines came falling down looking like rockets. I have gradually become accustomed to seeing machines falling down, but I must say it impressed me very deeply when I saw my first Englishman fall, and I have often seen the event again in my dreams.

As the day had begun so propitiously, we sat down and had a decent breakfast. Of course, all of us were as hungry as wolves. In the meantime our machines were again made ready for starting. Fresh cartridges were got and then we went off again.

In the evening we were able to send off the proud report: "Six German machines have destroyed thirteen hostile aeroplanes."

Boelcke's squadron had only once been able to make a similar report. At that time we had shot down eight machines. To-day one of us had brought low four of his opponents. The hero was a Lieutenant Wolff, a delicate-looking little fellow, in whom nobody could have suspected a redoubtable hero. My brother had destroyed two, Schäfer two, Festner two, and I three.

We went to bed in the evening tremendously proud, but also terribly tired. On the following day we read with noisy approval about our deeds of the previous day in the official communiqué. On the next day we downed eight hostile machines.

A very amusing thing occurred. One of the Englishmen whom we had shot down, and whom we had made a prisoner, was talking to us. Of course, he inquired after the red aeroplane. It is not unknown even among the troops in the trenches, and is called by them "le diable rouge." In the squadron to which he belonged there was a rumor that the red machine was occupied by a girl, by a kind of Jeanne d'Arc. He was intensely surprised when I assured him that the supposed girl was standing in front of him. He did not intend to make a joke. He was actually convinced that only a girl could sit in the extravagantly painted machine.

(To be concluded)

Heider Friction Drive Tractor

Made in Two Sizes with Ratings of 9-16 and 12-20 Hp.—Engine Slides Back and Forth in Making Changes of Speed—Fiber-Faced Wheel Is Driving Member, Which Obviates Formation of Flat Spots

THE outstanding feature of the Heider tractor, manufactured by the Rock Island Plow Co., Rock Island, Ill., is its friction drive, which enables a considerable number of tractor speeds and belt speeds to be obtained without the use of shifting gears. In the Heider the usual order of things in friction drives is reversed in that the fiber wheel is the driving member and the metal disks are the driven members, there being one disk for the forward speeds and one for the reverse. This arrangement overcomes the chief objection which has been made to the friction drive in the past, namely, that if the vehicle gets stalled and the drive slips it takes only a short time when a flat spot is worn on the friction wheel, and the drive is then very jerky in operation.

Another advantage of this arrangement of the drive is that when the tractor is pulling hard, and consequently the most power has to be transmitted, the fiber wheel engages the disk close to the outside rim, giving the best leverage and generally the best conditions of operation.

Waukesha Engine Used

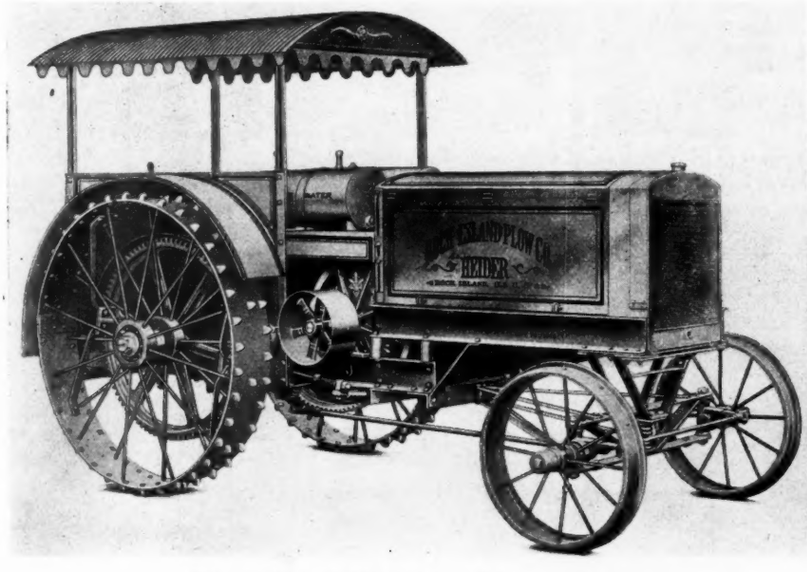
The Heider is made in two models, one having a 9-16 hp. rating and the other a 12-20. Both models are equipped with Waukesha engines. The 12-20, which is the model specially dealt with in this article, has a 4-cylinder engine of 4½ in. bore by 6¾ in. stroke. As the Waukesha engine is well known to our readers it is not necessary here to go into details of its construction. It has cylinders of the L-head type and is designed to burn either gasoline or kerosene. Lubrication of the engine is by the splash system. The engine is arranged longitudinally at the forward end of the frame and instead of being mounted rigidly on the frame is placed in guides so that it can be slid forward and back in order to obtain variations in gear reduction. The cooling system has a capacity of 9½ gal. A 22 in. fan is mounted back of the radiator at the forward end of the engine space and is driven by a 1¾ in. flat belt.

The fuel problem has been handled somewhat differently on the Heider than it is usually handled. Considerable supplies of both gasoline and kerosene may be carried, and the operator can use whichever fuel he considers best suited under the particular working conditions. There are two cylindrical fuel tanks mounted longitudinally in the cab. Each tank has a capacity of 14 gal. One of the tanks is designed to hold only kerosene, while the other tank has two compartments, one for gasoline and the other for water, each compartment having a capacity of 7 gal. The water is fed to the engine when kerosene is used as fuel in order to prevent preignition and knocking. The water feed can be controlled from the cab. Air is drawn in through a Bennett dust separator.

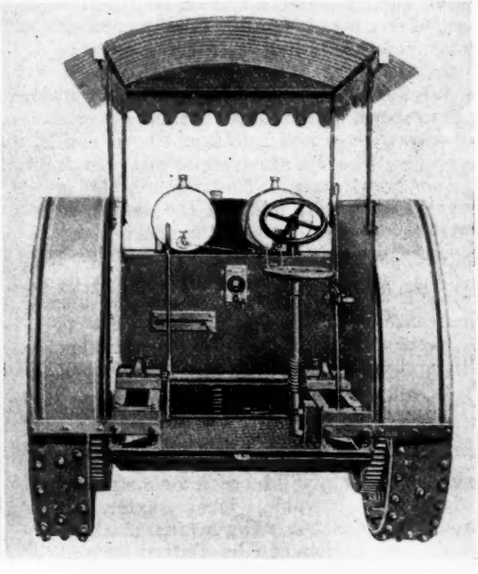
Beneath the carbureter, which is accessibly located, there are two large inspection plates in the crankcase, which can be readily removed when it is desired to get at the bearings. The lower half of the crankcase also can be readily removed, and this gives access to the main and connecting-rod bearings for inspection and adjustment. The pistons and connecting-rods can be taken out at the bottom without removing the crankshaft.

Ignition is by a Dixie magneto with starter coupling. As the engine is arranged to be slid lengthwise on the frame in making changes of speed, all of its accessories are carried on the engine so that they slide with it. This applies even to the spark, throttle and water control levers, which are mounted on a wooden bar extending back through an opening in the dashboard.

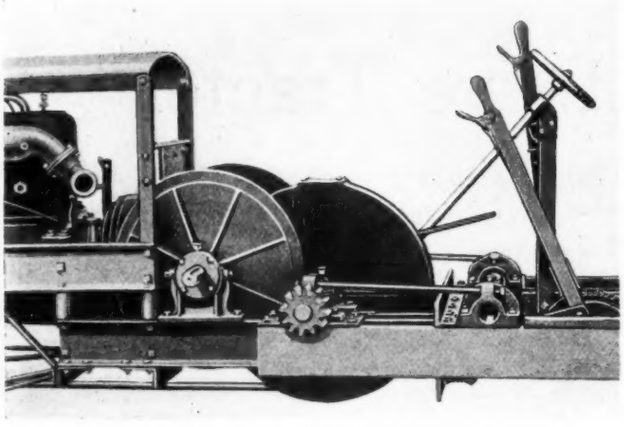
The friction wheel is integral with the flywheel of the engine and has a facing of fiber. The two driven friction disks are mounted on opposite sides of the flywheel close to the frame side members. These disks are 26 in. in diameter, while the wheel is of 20 in. diameter. When the tractor is at rest, the two friction disks are out of contact with the friction wheel. They are brought into contact with the rim of the wheel by axial displacement of the shaft on which the friction disks are mounted. Moving this shaft to the left brings the



The Heider 12-22 tractor with canopy top



A view in the operator's cab



Side view of friction drive and inclosed gears

right hand disk in contact with the wheel and gives forward motion, whereas moving the shaft to the right brings the left hand disk in contact with the wheel and gives the reverse speed. The pressure necessary for moving the shaft and placing wheel and disk in contact is transmitted to the shaft through a ball bearing thrust cage carried by the shaft. This shaft is carried in self-aligning ball bearings at both ends, these ball bearings taking the radial load only. From the shaft carrying the two friction disks the power is transmitted through a spur pinion and large spur gear to the differential shaft. This pair of spur gears is inclosed in a cast iron housing and operates in a bath of oil. The ends of the differential shaft carry the bull pinions that mesh with the bull gears on the driving wheels. The pinions are cut and hardened, while the large gear wheels are cast. By means of the friction drive a speed range of 1 to 4 m.p.h. is obtainable, in seven steps. The normal plowing speed is 2½ m.p.h.

The belt drive is also taken through the friction wheel and the right hand disk. When it is desired to do belt work the spur pinion on the friction disk shaft is slipped out of mesh with its gear. To this end it is provided with a grooved extension with which a shifting fork engages, and the pinion is shifted by means of a lever in the driver's cab.

Details of Heider

The frame of the Heider 12-20 is built up of 6-in. channels. The front axle is of the built-up type and has a coiled spring at the center through which the forward end of the frame is supported on it. The axle, of course, is steadied by means of radius rods extending to a cross member of the frame at about midlength. Steering is effected by means of a hand wheel in the cab which operates through a worm and worm wheel and a link and lever connection to the steering knuckles at the ends of the front axle. The front axle is swiveled on a ball joint at the center so that the running gear of the tractor can accommodate itself to uneven ground.

The frame is slung under the rear axle, giving a low-hung construction and unusual stability. This low construction is of particular importance in connection with orchard cultivation, for which work the canopy is removed.

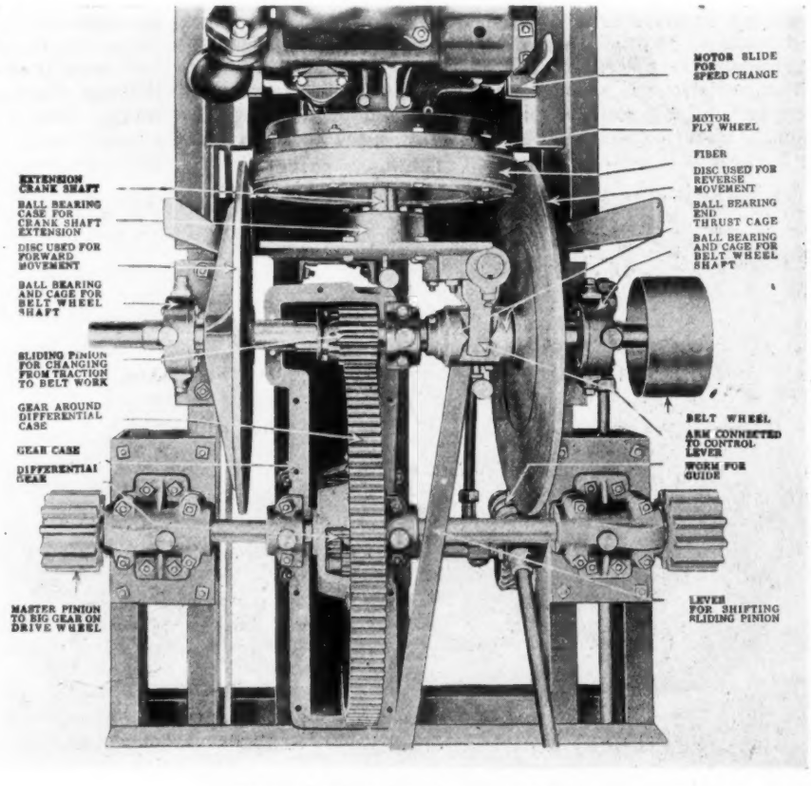
The seat is mounted on a vertical post with a coiled cushioning spring on it. In the rear view of the tractor, showing the inside of the cab, will be seen a substantial horizontally movable lever extending through the dashboard, by means of which the driving pinion can be shifted in and out of mesh. To the right of the steering post is the lever by means of which one or the other of the friction disks is forced in contact with the friction wheel and to the left of the steering post is another lever, for sliding the engine forward or back to vary the speed reduction, which moves on a quadrant with seven notches. There are no pedals, as the tractor has neither clutch nor brake, the reversing disk being used also for braking purposes. It is claimed that the machine can be thrown from high speed into reverse instantly without danger of injury.

Wheel Equipment

The wheels are ordinarily furnished with small pyramidal lugs and large cone lugs. For unusual soil conditions the company can furnish extension rims and also angle cleats, these being extras. However, the use of neither one nor the other of these is advised unless actually called for by the conditions, as both consume power.

The 12-20 model has a wheelbase of 96 in. The rear wheels are 57 in. in diameter and 10 in. wide, while the front wheels are 30 in. in diameter and 5 in. wide. The belt pulley is 14 in. in diameter and has a 7 in. face, and by means of the friction drive it is possible to obtain pulley speeds varying all the way from 100 to 800 r.p.m. The drawbar is so arranged that the hitch is 19 in. from the ground; it swings laterally and has a range of adjustment of 24 in. There is a sheet metal gear guard over the top half of each bull gear and a mud guard over the top half of each driving wheel. The sides of the cab join the mud guards. A corrugated sheet metal top over the seat is supported on four uprights. The weight of the Heider 12-20 tractor complete is 6000 lb.

AS in the case of the standard Brinell machine, there are limitations to all ball hardness testers. In those cases in which the metal is extremely hard a permanent deformation of the ball results. Where the test specimen is soft, the ball penetrates so closely to the supporting surface or anvil that the hardness of the latter affects the results. Small narrow specimens of hard steel crack under test and soft narrow ones permit of an easy lateral flow which affects the accuracy of the test. Fortunately, with the exception of thin pieces such as sheets, none of the above cases are so extremely common as to materially curtail the use of the Brinell machine.


MOTOR SLIDE FOR SPEED CHANGE
MOTOR FLY WHEEL
FIBER
DISC USED FOR REVERSE MOVEMENT
BALL BEARING END THRUST CAGE
BALL BEARING AND CAGE FOR BELT WHEEL SHAFT
EXTENSION CRANK SHAFT
BALL BEARING CASE FOR CRANK SHAFT EXTENSION
DISC USED FOR FORWARD MOVEMENT
BALL BEARING AND CAGE FOR BELT WHEEL SHAFT
SLIDING PINION FOR CHANGING FROM TRACTION TO BELT WORK
GEAR AROUND DIFFERENTIAL CASE
GEAR CASE
DIFFERENTIAL GEAR
BELT WHEEL
ARM CONNECTED TO CONTROL LEVER
WORM FOR GUIDE
MASTER PINION TO BIG GEAR ON DRIVE WHEEL
LEVER FOR SHIFTING SLIDING PINION

Plan of friction and gear drive

Paige-Detroit Brings Out 2-Ton Truck

Is Assembled of Standard Parts and Will Sell for $2,950—Body Designs to Be Extended on Completion of Government Contract

THE Paige-Detroit Motor Car Co. is now on the market with its 2-ton truck. This truck has been under development for some time and is an assembled model mounted on a wheelbase of 150 in. The Paige company has been building, during the past few months, on Government order, a number of trucks for overseas use. The 2-ton model is the first effort of the concern to market commercially a truck of this capacity and represents the entrance into the commercial vehicle field of another of the growing list of passenger car concerns which have previously confined their efforts to that field.

A limited number of the new Paige trucks will be distributed. As soon as the company can meet its Government obligation it will increase its production on this model and will widen the scope of body design in order to take care of various fields of transportation.

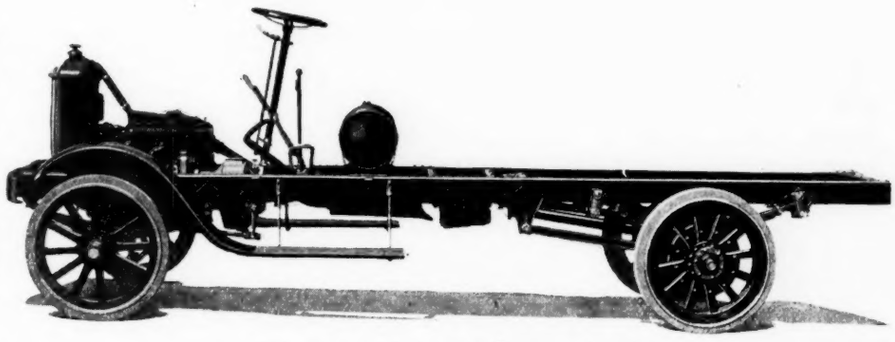
The chassis sells for $2,950. It is rated at 2 tons capacity. The frame is made up of pressed steel on a semi-flexible design. The truck is mounted on solid tires 36 x 4 front and 36 x 7 rear. The wheels are wood with square spokes.

The units composing the chassis are the product of well-known concerns in the parts field, the engine being a Continental, the bearings Timken, the carbureter a Stromberg, the governor a Pierce, ignition Bosch and the remaining list in keeping. The power plant is a unit type, the Continental engine being a four-cylinder 4⅛ x 5¼, with the cylinders cast together. The valves are on the right side.

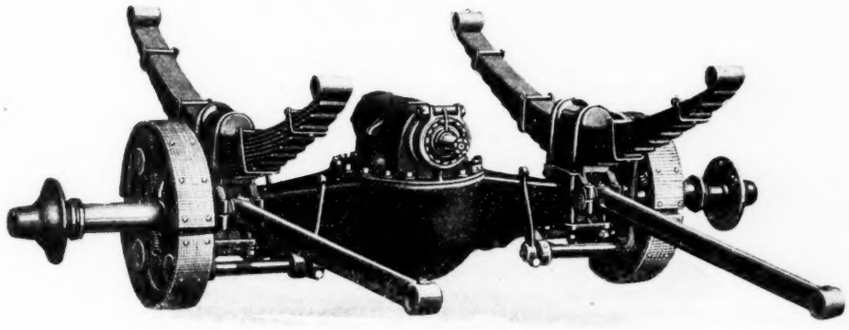
Pump-water circulation is used for cooling, the pump being a centrifugal type and the radiator a spiral finned tube. The ignition is set spark and no starting or lighting system is supplied. The carbureter is a Stromberg, 1¼ in. size, fed by a gravity tank.

The drive is delivered from the engine through a dry multiple-disk clutch having twelve plates. The gearset is selective sliding, located amidship, while the final drive is through a worm gear. The total reduction in high gear is 8½ to 1 and in low gear 34 to 1.

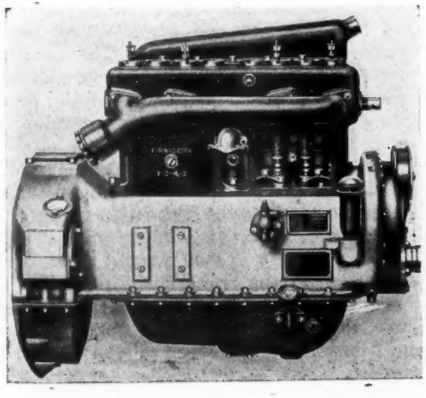
A Timken worm-driven type of rear axle is employed, mounted on Timken roller bearings throughout. The front axle is also a Timken design, with full Timken bearings. The brakes are on the rear wheels, the bands being 3½ by ¼ in. material.



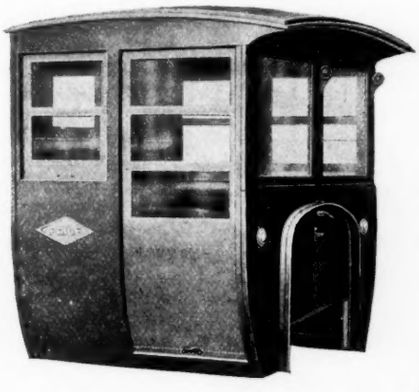
Side view of Paige 2-ton truck chassis



Rear axle with springs and radius rods



Continental engine of Paige truck



Inclosed driver's cab

THE British National Committee of the International Aircraft Standardization Board has been constituted and has taken temporary offices at the headquarters of the British Engineering Standards Committee. The National Committee is under the chairmanship of Sir Arthur Duckham.

National committees are also being formed in America, Canada, France and Italy. The constitution of the International Commission has been agreed upon and approved, and the Inter-Allied Conference held in London last March is to be considered as the first meeting of the Commission, the second meeting, which will be held in London, being scheduled for the beginning of October next. During the war the Ministry is to be consulted regarding the nomination of British delegates, and after the war any other nation desiring to join the International Commission, according to the statutes, "may do so subject to the approval of the Commission."

Tests of Benzol as Motor Fuel

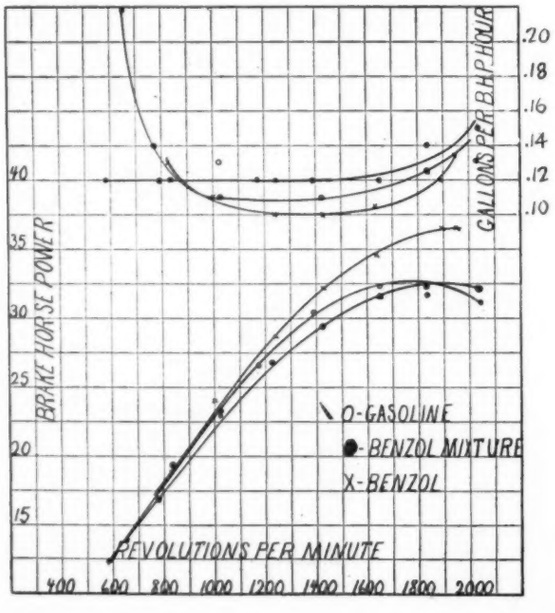
Increased Maximum Engine Horsepower and Reduced Fuel Consumption per Horsepower-Hour Shown by Trials Conducted by Automobile Club of America

AT the request of the Barrett company, New York, the Technical Committee of the Automobile Club of America conducted a series of tests with benzol and a benzol-gasoline mixture as fuel for internal combustion engines, and for the purpose of comparison all of the runs were also made on gasoline.

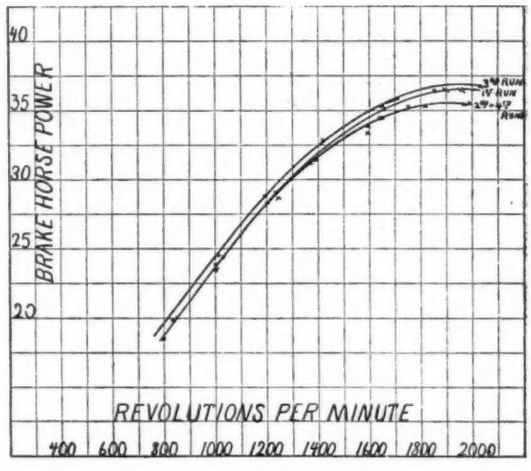
The tests were conducted with a 4-cylinder Continental engine of 3¾ in. bore by 5 in. stroke, direct-connected to an electric cradle dynamometer. The engine was equipped with a Stromberg carbureter, Bosch DU-4 magneto and Titan AC spark plugs, the points of which were set 0.015 in. apart. The brake horsepower developed at different speeds between 600 and 2000 r.p.m. was determined when the engine was being run on gasoline, then with a mixture of three-quarters benzol and one-quarter gasoline, and finally with straight benzol. A run of several hours' duration at approximately 1000 r.p.m. was also made successively on gasoline, benzol, and the mixture of the two. All of these tests were made with the throttle valve wide open.

The first run was made on gasoline and the results of the hp. determinations are plotted in Fig. 1. In the same illustration is also shown the fuel consumption at the different speeds. The engine was next allowed to run for 6½ hours at an average speed of 1064 r.p.m., during which run it developed an average of 24 b.hp. and consumed 19.1 gal. of fuel or 2.94 gal. per hour. This is at the rate of 0.122 gal. per hp.-hr.

At the completion of this run the engine was dismantled and a determination made of the carbon adhering to the top of the pistons, which amounted to 1.8 grams. After the engine was assembled again and fresh oil was put into the crankcase, the carbureter adjustment was changed to give a leaner mixture, and the time of ignition was shifted so that the mixture fired 12 deg. after top dead center instead of on the dead center as in the previous run. The engine was



Horsepower and consumption curves for three different fuels



Results of three horsepower runs on benzol

then run on the benzol-gasoline mixture for a determination of the hp. and fuel consumption curves. From the results plotted in Fig. 1 it will be seen that below 1000 r.p.m. there was no appreciable difference in the power developed with the gasoline and with the benzol-gasoline mixture respectively. Above this speed the mixture gave slightly less power, but between 1820 and 2000 r.p.m. the power was greater than with gasoline. A decrease in the fuel consumption was observed above 880 r.p.m., as compared with the run on gasoline, the greatest decrease occurring between 1100 and 1400 r.p.m.

After the horsepower determinations were completed the engine was run for 4½ hr. at an average speed of 1086 r.p.m., during which time it developed an average of 26.6 b.hp. and consumed 13 gal. of fuel. During this run the consumption was at the rate of 2.89 gal. per hr. or 0.109 gal. per brake hp.-hr. This is a decrease of 10.7 per cent from the run on gasoline. It is stated in the report that the engine ran more uniformly during this test than during the test with gasoline and appeared to labor less.

An examination of the engine after this run showed less carbon on the pistons; in fact, if it had not been for a small amount of oil carbon around the edges of two of the cylinders there would not have been enough carbon to weigh.

After the engine had been cleaned and reassembled, four horsepower runs were made on straight benzol. The results of all four runs are plotted in Fig. 2, while the curve plotted in Fig. 1 as obtained with benzol gives the results of the first run. This curve shows an increase in the power developed by the engine with benzol over that produced with either gasoline or the benzol-gasoline mixture throughout the whole speed range. A great deal more power was obtained with benzol than with gasoline, especially at the higher speeds, the increase amounting to 18 per cent at 2000 r.p.m., 9.3 per cent at 1400 r.p.m. and 2 per cent at 800 r.p.m. The fuel consumption which is plotted on the same sheet indicates a decided decrease as compared with gasoline between 930 and 1800 r.p.m. Above the latter speed the decrease becomes less and less, and below 930 r.p.m. the fuel consumption rapidly increased.

Next the engine was run for a period of 4¾ hr. on benzol

(*Continued on page* 845)

Labor Representatives Lack Sufficient Power

Confidence Between Employer and Employee Difficult Because Their Representatives Cannot Obligate the General Body to Any Definite Line of Action

By Harry Tipper

"THE third essential, therefore, that I would postulate is that both employers and employed should be efficiently organized in order that industrial problems may receive a broader and more statesmanlike consideration. In many ways Labor is more efficiently organized than Capital, but there are indications of a fatal defect in some Labor organizations, which, if not corrected, may well prove their undoing. I refer to the tendency on the part of the rank and file to refuse powers to their leaders, and to throw over agreements that they have negotiated. It is not characteristic of democracy, but of mob rule, that every agreement should be subject to ratification by a plebiscite, for collective bargaining and even collective negotiation becomes impossible unless the representatives on each side are endowed with authority."—W. L. HICHENS, *Chairman Cammell, Laird & Co., Ltd.*

THE defect in labor organization which Mr. Hichens refers to has been very much in evidence in the war period. The large majority of strikes which have occurred in this period have been carried out by local bodies of workers against the express wish of the general leaders of the organizations and in direct contravention of agreements made by those leaders in the names of the organizations involved.

When Labor Agreed

When the labor shortage was not so acute and the only prospect of securing a greater share of the remuneration was through the strength of a general organization, the worker was willing to abide by the dictates of the general body to that extent, although even under those conditions there are plenty of instances of the disregard of agreements made by the representatives of labor.

Under the war shortage of man-power for industry, the possibilities of securing greater pay have been sufficiently alluring to particular sets of workmen in individual localities to induce them to strike against their own agreements and against their direct responsibilities to their own organization constitution.

There is little doubt that the efficiency and character of the labor organizations has been weakened by this decrease in the power of the regularly constituted representatives and the elected authorities.

In political matters it would be impossible to have any orderly government if the whole body of the people were to pass upon every individual action of its representatives and change their decision at will; and this would be equally impossible if groups of the people were to disregard the obligations incured by their representatives and act against such obligations and outside their agreed constitution.

There is some danger that we have not thoroughly learned this lesson even in political matters.

It is sure that any collective bargaining, which is to leave industry in a stable condition to pursue its normal functions of production and distribution, must be made between men who are capable of obligating the bodies of which they are the accredited representatives.

There is a feeling of lack of confidence in the conferences and discussions between employers and labor organizations at the present time, due in part to the lack of power held by the representatives in many cases and the impossibility of their obligating the general body of labor to any given line of action.

No Value in Separate Action

If this tendency to separate action continues on the part of groups within the labor organization, as it has been observed during the war period, then the occupational labor organization as it is at present constituted will be without any value for the purpose of decision of industrial relations.

The reason for this lack of power and this partial disintegration of the labor organization is fundamental. The question of wages and conditions of work is an immediate and local one. The amount

paid in a distant shop under different conditions is of little importance.

The real problem lies in the position of the worker in his individual shop and in his individual locality.

Were it not for the constant migration of labor and the disregard of labor necessities by the employer, the place of the occupational labor organization would be still weaker, and in that respect the comment upon the situation in Great Britain is very significant, especially so when it is recorded that the labor unions in that country are very strong and in the key industries comprise a majority of the workers.

These questions of responsibility and decision, which have arisen out of the tendency to "mob rule" in labor organization, especially exhibited during war time, give the employer greater opportunity to institute a different method of collective bargaining in his own organization, which promises greater benefits to the workman and a greater measure of responsibility in agreement, as well as a more important incentive to stability of labor and lessened turnover.

Two Points to Observe

In this connection there are two points to be observed in the results of the experiment recorded in last week's AUTOMOTIVE INDUSTRIES, which indicate the character of agreement between employer and employee when considering the matter for the benefit of their local necessities.

It will be remembered that the organization in this particular plant consisted of a body composed of representatives of the workmen, a similar body composed of the salaried executives of the company, a joint conference body between these two, and a final approving body consisting of the officers of the corporation.

It will also be noted that this experiment has been operating for a period of 3 years, or sufficiently long for some basis of understanding to be reached between the different bodies and some degree of confidence to be established.

Without this latter point the results would be of little value, because the real value of such organization cannot be determined until sufficient time has elapsed for a considerable degree of personal acquaintance and confidence to be established.

It will be remembered that the representatives of the workers brought up the question of wage increases at frequent intervals during the last period covered by the report, in common with workers all over the country.

At first these increases had been paid arbitrarily as increases in wage scales. Later, however, the organization of salaried representatives, although feeling that temporary increases should be established, did not feel that the scale should be increased when the scale of prices upon which it was based might recede and make the wage disproportionate and a burden upon the business.

As a final conclusion of the conference between this body and the representatives of the workers, it was agreed to increase the pay by a separate amount corresponding to the cost of living, to be given in separate envelopes, to be called cost-of-living bonus and to be based monthly upon Bradstreet's index scale.

This is the first time in the records which the writer has examined during a long study of the subject that the wage scale has been based, definitely, upon a cost-of-living basis and allowed to fluctuate at monthly intervals upon that basis.

It is a fundamental change, because it allows the amount of the wage to be variable while the base upon which it is calculated is fixed and understood.

Such a system could never have been put in motion by an employer without involving him in serious labor trouble and perhaps ruining his organization. It could never have come out of the discussions between industrial groups and occupational labor organizations as generally constituted, for the plan would have had no opportunity to be studied.

It came, however, out of the intimate discussions by men who had become thoroughly acquainted, who were interested in the same plant, the same local conditions and the same organization, and it is far in advance—as an experiment in wage calculation—of anything so far recorded.

Of course one successful record, even though it does involve an attempt at wage-making based upon something more than a trade, is not sufficient to indicate a solution; but it does add another to the tendencies which indicate possibilities of solution in the frank and firm tackling of the problem by giving the worker of the individual organization a hand in the decision as regards his own condition, this to be accomplished through permanent machinery which permits the growth of acquaintanceship and confidence that must be the forerunner of any successful decisions.

A number of such experiments are being established and an article in the near future will be devoted to the analysis of a recent plan.

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Hall-Scott Completes Tests of Twelve-Cylinder Engine

INCORPORATING many of the features of the six-cylinder Hall-Scott engine, together with some new ones, the new A-8 twelve-cylinder airplane engine has just been given its final test at the West Berkeley, Cal., plant of the Hall-Scott Motor Car Co.

The A-8 type engine has a horsepower rating in excess of 450 and a weight of less than 900 pounds. It is stated that the first block tests, late in July, had to be stopped after the engine was placed on the stand, gradually warmed up and run, because it was evident that the power developed was too great for the testing stand. A special one is being built, and a dynamometer of 600 hp. rating has been sent for, on which the final test will be completed. The engine is fitted with a four-blade propeller.

Its twelve cylinders are of 5 in. by 7 in. bore and stroke and are of the pressed steel jacketed type, similar to those which are used in the construction of the Liberty engine. Standardized gears are used throughout, and with the cylinders are made interchangeable with 4, 6 and 8-cylinder engines of the A-5, A-7 and L-6a types of Hall-Scott motor.

We are informed by representatives of the Hall-Scott company that this A-8 twelve-cylinder engine was completed and ready for its preliminary tests May 1, 1917, and had been placed on the testing block, when Col. E. J. Hall, now of the Aviation Service, its designer, was called to Washington.

The Willard Tractor Battery

Comprises Extra Heavy Plates and Thread Rubber Insulators in Thick Walled Rubber Jars—Battery Supported on Rubber Bumpers and Coiled Springs Are Inserted in the Hold-Down Rods

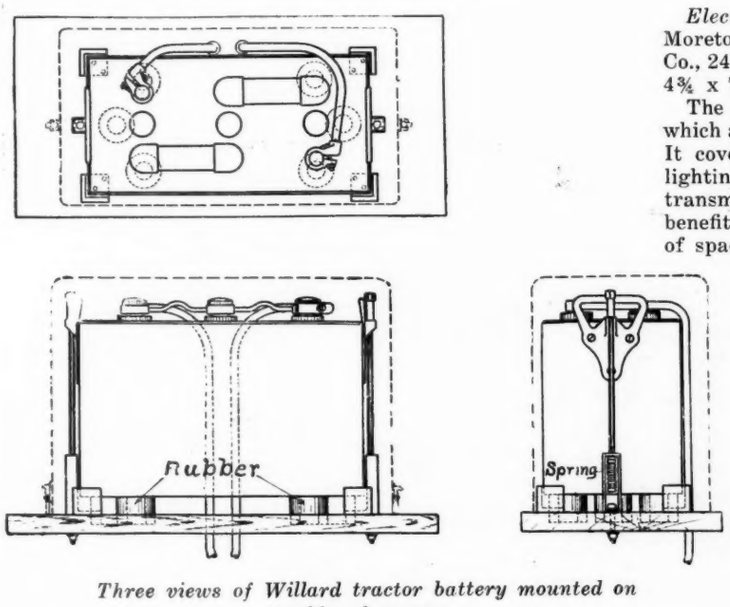
THE present year has witnessed the advent of electrical starting and lighting equipment on tractors. The successful application of this equipment on automobiles and trucks during recent years developed a new branch in the manufacture of electrical apparatus for this service. The success of this system lies fundamentally in the fact that it is possible to store enough energy from an electric generator at a low rate of charge and have it available at high rates of discharge to start any size of internal combustion engine. This is accomplished by the use of the lead-acid type of storage battery.

Tractor engineers and manufacturers were at first dubious as to whether or not a storage battery would stand the severe service to which it would be subjected if placed on a tractor. The storage battery manufacturer met this situation, however, by developing a new type of battery for tractor service. This battery was built more substantially mechanically and insulated with the threaded rubber insulation instead of wood separators.

During the present year, two large tractor manufacturers used electrical apparatus with a storage battery as regular equipment of their tractors. The next year will witness many more applications of this system.

Supported on Rubber Cushions

The accompanying illustration shows the new type of tractor battery and mounting as recommended by the Willard Storage Battery Co. of Cleveland, Ohio. Although this battery was developed to withstand the severest vibrations, it is mounted on rubber bumpers, as shown, as an extra precaution. A small coiled spring is placed in the hold-down member over the handles of the battery to take the slight rebound of the battery mounted on these cushions. Formerly, wherever the vibration was severe, such as in truck service, the storage battery was mounted in a cradle supported by four helical springs. All experimental tests on this new bumper mounting and also service conditions are said to show the new mounting of the battery to be superior in every way to any spring suspension that has been devised.



Three views of Willard tractor battery mounted on rubber bumpers

In the manufacture of the battery, plates 11/64 in. thick are used. These plates are insulated with heavy threaded rubber insulators, the type of insulation that replaced the wood separators on many of the batteries used on automobiles and trucks during the past two years. The material used in the manufacture of the hard rubber jar is required to meet the severest specifications of tensile strength and percentage of elongation. The thickness of these jars has been increased 50 per cent over that used in the automobile type of storage battery. The case containing the cells is made of extra heavy hardwood, the sides being fastened together by means of two long bolts between the cells of the battery.

Tested on Jarring Board

In the development of this tractor battery a bumping platform was used to give the battery the severest vibration test. The battery was fastened to this platform rigidly without the use of rubber cushions or spring suspensions. A four-point cam arrangement dropped this platform on a solid anvil at a rate of 560 vibrations per minute. In a test of 30 hours' duration the battery was subjected to approximately one million bumps. It was necessary for the battery to withstand this test without any failure before the final construction was approved as satisfactory. Subsequently some of these batteries were tested by doubling the length of time to 60 hours; the battery withstood this test also without failure.

As a result of these tests and also the excellent service given on heavy duty trucks, the Willard Storage Battery Co. recommends the application of this battery for all truck and tractor service.

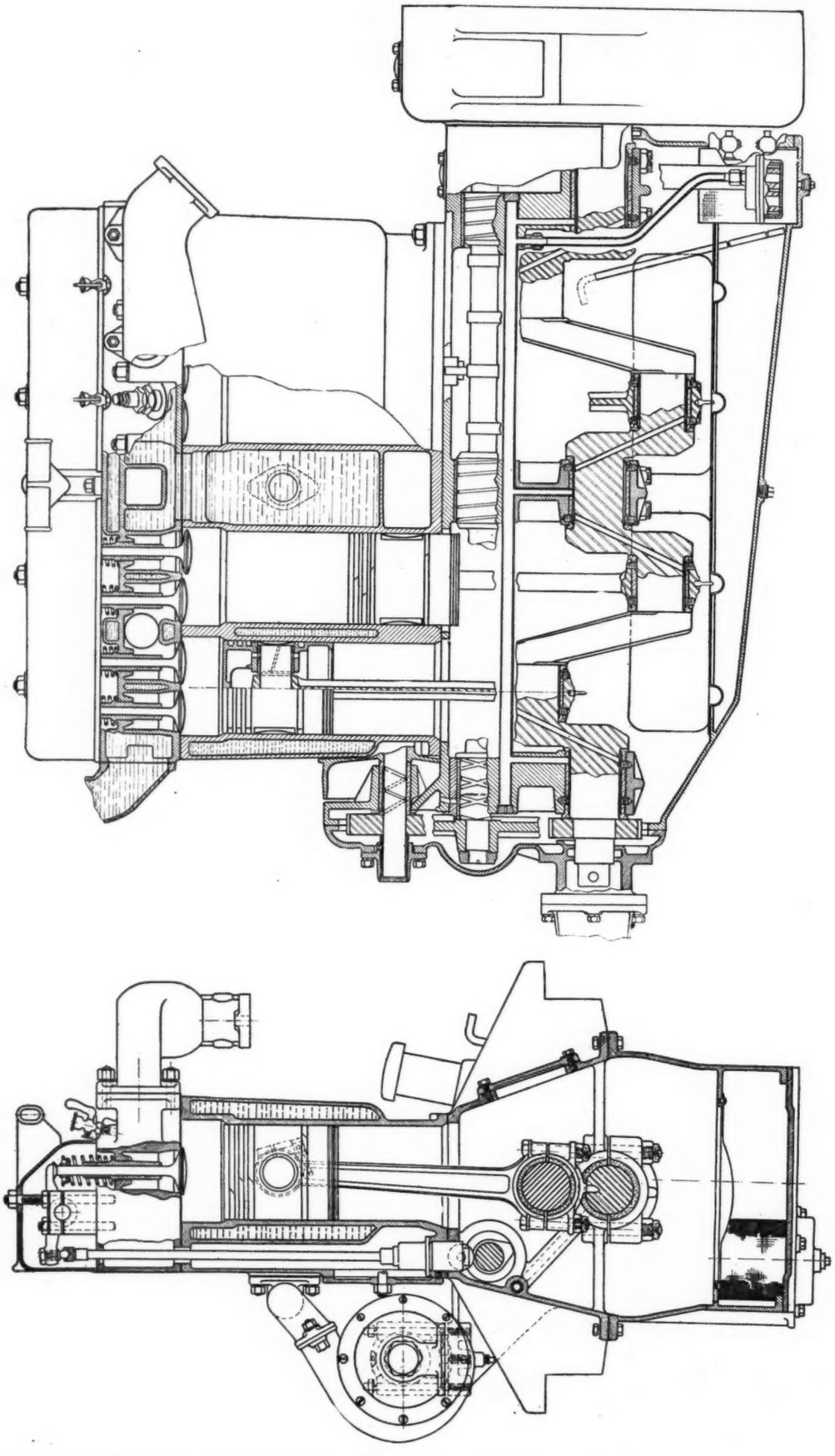
Book Review

Electrical Equipment of the Motor Car, by David Penn Moreton and Darwin S. Hatch. Published by U. P. C. Book Co., 243-249 West Thirty-ninth Street, New York. 506 pages; 4¾ x 7 in. Price, $2.50.

The volume under review is a reprint of a series of articles which appeared in *Motor Age* of Chicago during the past year. It covers the whole field of electrical equipment, including lighting, starting, ignition, signalling, gear shifting and transmission apparatus, and was written specially for the benefit of the automobile owner and repairman. A great deal of space is devoted to the principles of electricity which are explained with the aid of hydraulic analogies. Magnetism and electromagnetic induction are dealt with equally extensively and next the principles of generators and motors are taken up. There are also chapters on switches, electric lamps and electrical instruments. Following the section on starting and lighting comes that on ignition, which comprises five chapters, one treating of the subject in general, one being devoted to magnetos, another to battery-generator ignition, another to spark plugs and the last to ignition wiring and timing. The two concluding chapters of the book relate to electric signals and accessories and to electric gearshifts and transmissions respectively.

The treatment of the subject is of an easily understood character and the text is well illustrated.

Sectional Views of Beaver Tractor Engine



This engine is made in two four-cylinder models, 4½ x 6 in. and 4¾ x 6 in. respectively. The right-hand view is specially drawn to bring out features of the cooling and lubricating systems

Beaver Kerosene Tractor Engines

Of the Valve-in-Head Type—Made in Two Sizes, of 4½ and 4¾-In. Bore Respectively, and in Unit Power Plant and Independent Types

THERE are two sizes of the Beaver four-cylinder tractor engines, both of which are very much alike, there being only a difference of ¼ in. in the cylinder bore, and all parts of the two engines with the exception of the cylinder block, pistons, piston rings, and piston pins, are identical. There is also a slight difference in the length of the push rods, as the larger bore engine requires a somewhat greater compression space and its cylinder block is ⅛ in. higher than the other. One of the engines has 4½ x 6 in. cylinders and the other 4¾ x 6.

The four cylinders are cast in a block, and each is fully surrounded by water. The cylinder heads, which contain the valves, are removable, and a copper-asbestos gasket is placed between the cylinder block and the head casting.

The pistons are of conventional design, with three rings above the piston bosses and one below. The piston pins are clamped tight in the connecting-rods, and rock in bronze bushings in the piston bosses.

The crankcase consists of two iron castings which are joined in a horizontal plane through the crankshaft axis. The engine is made in two types, one with bell housing and the other without, to meet the different requirements of customers. The bell housing type is practically always made with provisions for three-point support, two arms being cast on the bell housing and a turned hub provided centrally at the forward end of the crankcase for support on a cross member of the frame. On the other hand, engines without the bell housing are ordinarily furnished with four supporting arms on the upper half of the crankcase, as shown in the cross-sectional view.

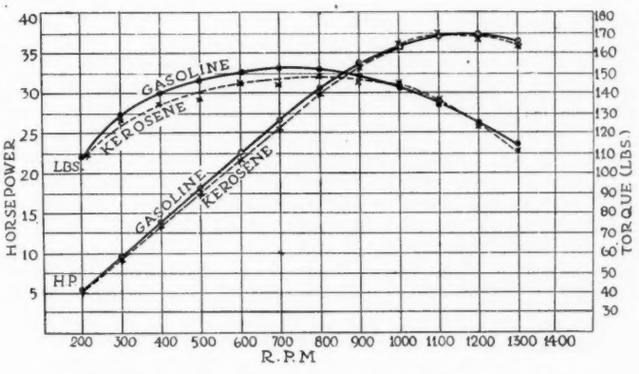
Crankcase Design Varies

In some designs the lower half of the crankcase is provided with a removable bottom plate, and after this plate has been taken off, the sheet steel splash basin can be taken out through the opening in the bottom of the case, in order to be able to get at the bearings. In the bell housing design, however, the bottom of the crankcase lower half is made integral and hand holes with cover plates are provided on either side, through which the main and connecting-rod bearings can be adjusted.

A crankshaft of very rugged design is used. It is of the usual medium carbon steel drop forged type, with three supporting bearings. The dimensions of these bearings (front to rear) are as follows: 2⅜ x 3½, 2⅜ x 3½, and 2⅜ x 4½ in. The crankpin bearings are 2¼ x 2¾ in. and the piston pin is 1½ in. in diameter. The camshaft also is supported in three bearings, the dimensions of which are as follows (front to rear): 1¾ x 3, 2½ x 3⅛, and 2 x 2 5/16 in. At the forward end of the camshaft there is a very heavy bushing, and the design is such that the whole camshaft with its integral cams can be withdrawn from the engine through the forward end.

The camshaft journals are cut with helical grooves which tend to distribute the oil and to clean the bearings. The main and connecting-rod bearings are of the bronze-backed, babbitt lined type, while the camshaft bearings are bronze bushed. The camshaft driving pinion, and the accessories shaft gear are made of steel, while the camshaft gear is of cast iron. Woodruff keys are used to fasten these different gears to their shafts.

Beaver engines are designed to burn kerosene, and are provided with special vaporizing manifolds in which the inlet manifold is completely surrounded by the exhaust manifold. The engines are of the low-compression type, as desirable for burning kerosene, and the interior surfaces of the combustion



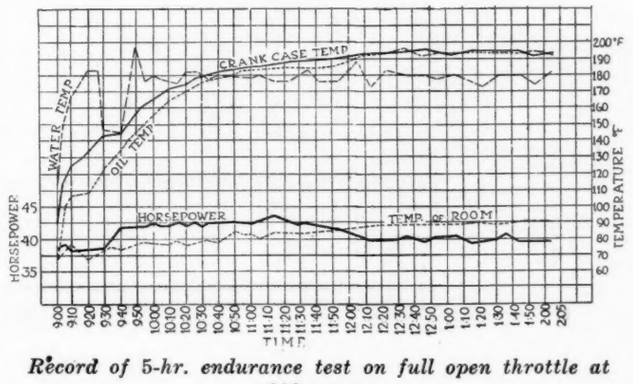
Horsepower and torque curves of 4¾ x 6 in. engine

chambers are completely machined. The valve seats and spark plug bosses are entirely surrounded by water. The valves are made of as large a diameter as can be gotten into the cylinder heads, and have a lift of ⅜ in. In order to reduce the frictional losses within the engine the cylinders are offset ½ in. from the crankshaft axis. A magneto bracket is provided, and usually a magneto is used for ignition, but in case it is desired to fit a generator and use battery ignition the generator can be mounted on the magneto bracket.

The valves are operated through the intermediary of tappet rods extending up the sides of the cylinders and rock levers on top of the cylinder heads. The cam followers are of the roller type, and their stems are made hollow for the sake of lightness. There is a screw adjustment with ball and socket joint at the upper end of the tappet rod. The rock levers rock on a stationary shaft which is clamped between pillow blocks and caps, and are provided with bronze bushings. The entire valve mechanism on top of the cylinder head is inclosed by cast iron housing, held in place by some of the studs which serve to fasten the pillow blocks to the cylinder head.

Lubrication is by force feed to the main and crankpin bearings, with additional oil feed by splash. There is a gear type oil pump in the lowest part of the oil well, at the flywheel end. This pump is driven from the rear end of the camshaft through helical gears. From the pump the oil is forced through a distributing pipe cast in the upper half of the crankcase and through branch drill holes therefrom to the main bearings, and from the latter it passes through the drilled crankshaft to

(*Continued on page* 862)



Record of 5-hr. endurance test on full open throttle at 900 r.p.m.

Maybach 300-Hp. Aircraft Engine

Lubricating System—Details of the Oil Pumps, of Which Three Are Used—Cooling and Ignition Systems—Carbureter and Fuel Feed System

Part III

SEVERAL details of the lubrication system have been completely redesigned in the new Maybach engines. The former single oil pump, which was of the plunger type, has now been replaced by three separate oil pumps of the gear type. These, as shown in Fig. 1, are fitted in the bottom of the base chamber. The main oil-pressure pump is at the rear end, while the two scavenger pumps are situated one at each end of the base chamber.

The general principle of the lubrication system is here clearly shown in the special diagrammatic drawing, Fig. 19, which is to a great extent self-explanatory. In this diagram the lubrication system is shown with all the oil pipes and oil-ways marked in black. The system briefly described is as follows: Oil is delivered from the separate oil tank by the pressure oil pump, which is the rearmost pump of the two at the rear of the sump, and forces oil under pressure to the crankshaft journal bearings through an external oil main, which runs the whole length of the crankcase on the induction side, as shown in Fig. 20.

From this main oil pipe oil is forced to the journal bearings through oil ways drilled diagonally in the crank chamber casting through the transverse webs which support the housings of the journal bearings; these are lubricated by a wide helical oil groove cut in the bearing white metal. For the lubrication of the crank pins and the connecting-rod small-end bearings, the well-known Maybach system of centrifugal pressure lubrication is adhered to. In this system the oil, which is forced out through the ends of the journal bearings, is collected by the oil scoops, which are bolted to the outer sides of each crank web, as shown in the view of the crankshaft already referred to.

By centrifugal action the oil is forced up the outer surface of each crank web and led through a channel into the hollow crank pins, thence through a small hole bored radially in each crank pin to the connecting-rod big-end bearings. From the big-end bearings the oil is forced upward to the small-end bearings, with their floating piston pin bushes of cast-iron, through the steel pipe fixed in the center of the connecting-rods. Details of this design have already been given. Fig. 18 is a detail sketch of one of the aluminum oil scoops, which are bolted in pairs to the crank webs by a bolt which passes through the center of the end crank pin. From the front end of the main oil pipe a steel pipe is connected by a union, which leads to a hole drilled in the crankcase casting, and serves to lubricate the bearings of the camshaft intermediate gears. A restricting plug is fitted into the end of this oil lead, and a similar restriction is provided in the end of the main leading back into the crank chamber, as shown in the lubrication diagram.

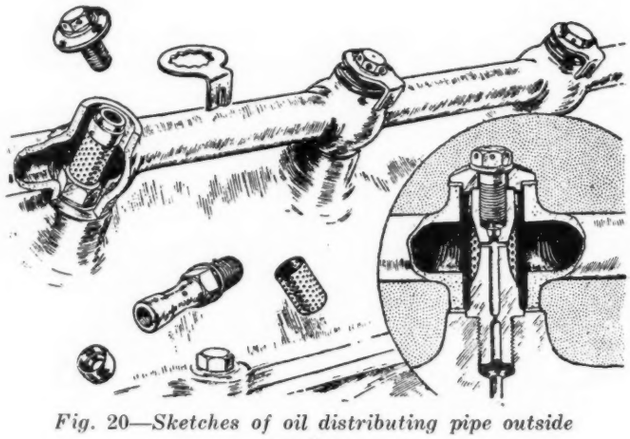


Fig. 20—Sketches of oil distributing pipe outside crankcase

A check valve, it will be noticed, is fitted in the main oil supply system. This check valve, together with a small spring-loaded pressure relief valve, is situated inside a small detachable valve chamber, which is attached to the bottom of the crank chamber just beneath the main oil pump. It will be noticed in the lubrication diagram that the excess oil pressure is delivered back into the oil pipe on the supply side of the pump. An oil pressure gage is connected to the main oil lead as shown, and small oil pipes are also taken from the main pressure pipe to the small crank chamber of the fuel pump, and also to the water pump driving spindle.

The two scavenger oil pumps, situated one at either end of the base chamber, are designed so as to draw off the return oil which collects in the small detachable oil sumps in the bottom of the oil base, and to return it to the tank from either end. These scavenger pumps are connected together by a steel pipe, 21 mm. diameter, the ends of which are coupled to the suction ports of the two gear oil pumps. This interconnection of the two pumps to a certain extent balances the oil return to the tank from the front and rear ends of the oil base, enabling both scavenger pumps to operate at any angle of the engine. A small quantity of oil is always carried in the oil base, as shown in the lubrication diagram. The cam-

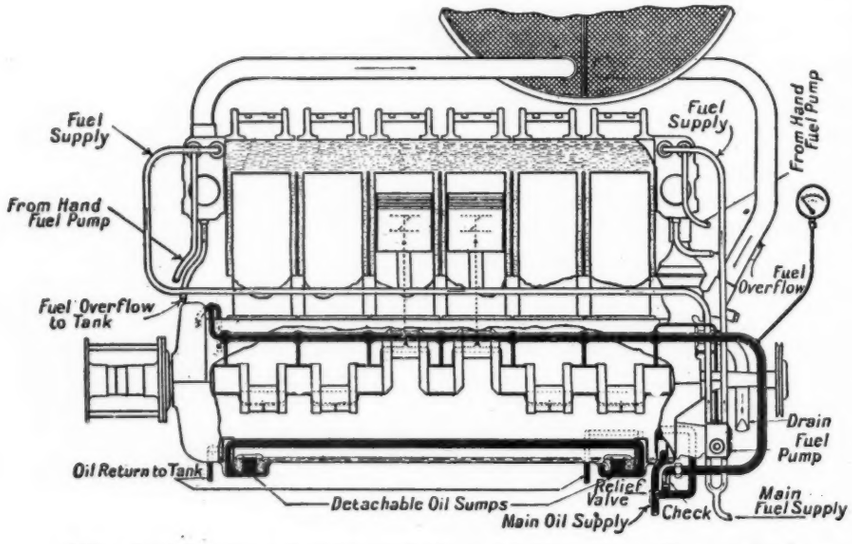


Fig. 19—Diagrammatic representations of oiling and cooling systems

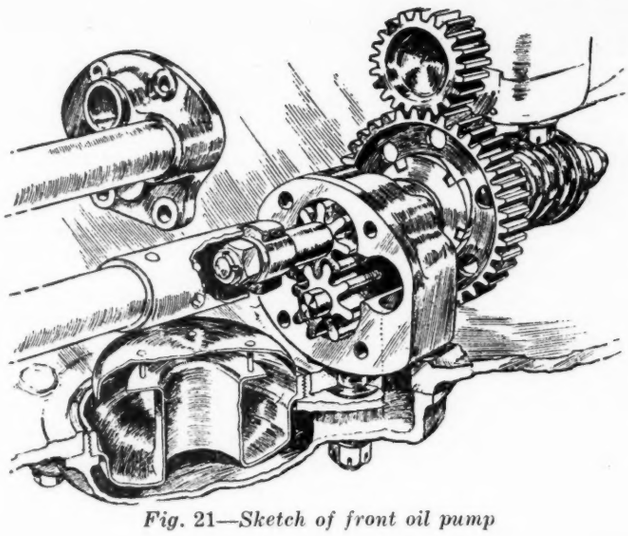


Fig. 21—Sketch of front oil pump

shafts, tappets and cylinder walls are splash lubricated by the surplus oil thrown off of the crankshaft and oil scoops; and the camshaft and magneto gears are lubricated through oil ways cut in the camshaft bearings at either end. Baffle plates are fitted below the cylinders in the recesses machined in the top face of the crank chamber, as shown in Fig. 22.

Constructional Details of Oil Pumps

No provision is made for lubricating the roller bearings of the overhead valve rocker spindles, and no oil holes are made in their brackets for hand lubrication. The general design of all three oil pumps and their delivery is the same. The general construction is clearly shown in the sketch of the front scavenger pump, Fig. 21. A pair of pump gears of the usual formation, 30 mm. diameter, work in a body casting of cast iron. The top pump gear is of steel, and is machined integral with the driving spindle of the pump, while the lower pump gear is made of gun metal. The oil pumps are secured to the machined seats cast on the bottom of the oil base by a stud in each case, which also serves to hold the small detachable oil sumps in position. These oil sumps consist of aluminum castings, into the cupped center of which is screwed a spun brass oil trap, formed as shown in the sectional perspective sketch. These oil sumps are connected to the suction ports of the oil pumps by a passage formed in the sump body castings.

All three oil pumps are driven at the same speed, the two scavenger pumps being connected together by a light tubular shaft which engages with dog clutches at either end; the pressure oil pump is driven off the spindle of the rear scavenger pump through a dog clutch extension of the spindle. The method of driving the oil pumps at the front end of the engine is interesting and unusual. As shown in the sketch, Fig. 21, the driving gear wheel which is mounted on the front extension of the pump spindle is provided with a spring-loaded face ratchet, the teeth of which are cut inside the gear as shown, and engage with similar teeth cut on a flange on the front of the pump driving spindle. The strength of the spring is such as to allow the driving gear to overrun the driving spindle, and apparently in the event of backfiring, all the oil pumps become inoperative, and oil would thus be prevented from being sucked back into the oil base by the two scavenger pumps.

An interesting feature in the lubrication system of these engines is found in the small separate oil filters, which are provided at the top of each of the diagonal oil ways drilled through the webs of the main journal bearing housings. The small filters are screwed into the bosses, which are cast on the outside of the crank chamber, and to which the detachable main oil pressure pipe is attached.

In Fig. 20 the method of attaching the main oil pipe by a set screw and a cap fitted with a leather washer is shown. The set screw is screwed into the top of the filter plug at the top of the drilled oil lead, and a small jet or drilled plug is fitted below the set screw, the plug being let into a small recess cut in the top of the oil lead. The bore of this plug corresponds to the bore of the restriction formed in the oil lead drilled in the filter plug just below as shown. This device is apparently provided to allow for a special plug to be attached in place of any of the six set screws, which can then be coupled to a pressure gage, thus giving the oil pressure at any of the main bearings.

Further details of the formation of the oil passages drilled through the crankcase to the journal bearings, and also of the construction of the main bearing caps, are given in the sketch, Fig. 22, which shows the underneath view of the top half of the crank chamber. The oil is led round the bearing bolts through circular oil grooves cut in the face of the bearing housings. The small holes drilled in the crankcase above the joints, as shown, communicate with recesses machined around the bolts. These holes are made to prevent the oil from being forced upward out of the engine through the bolt holes in the crank chamber.

Water Pump and Water Cooling System

Details of the construction of the water pump are shown in the sectional drawing, Fig. 23. The body of the water pump is attached to the top face of the separate aluminum casting which forms the cover of the magneto driving gears. This gear cover is attached by bolts and studs to the rear end of both the top and bottom halves of the crank chamber. As may be seen in the general arrangement drawing of the engine, the water pump spindle is driven through a dog clutch at its lower end by a short vertical spindle running in a bronze bush bearing; this spindle is driven by a bevel gear meshing with the main bevel fixed on the rear end of the crankshaft.

The water pump vertical spindle, which is 20 mm. in diameter, runs in a bronze bearing, which is lubricated by a screw grease-lubricator. The top portion of the pump spindle bearing is cupped to form the housing for a thrust ball race, above which is fixed the pump rotor.

The pump rotor is a gun-metal casting, having six helical vanes 110 mm. in diameter. The rotor is fixed to the pump spindle on a taper and key, and is locked by a domed nut and locking washer.

The lower half of the pump body is an aluminum casting with an inlet passage 54 mm. in diameter, to which the diag-

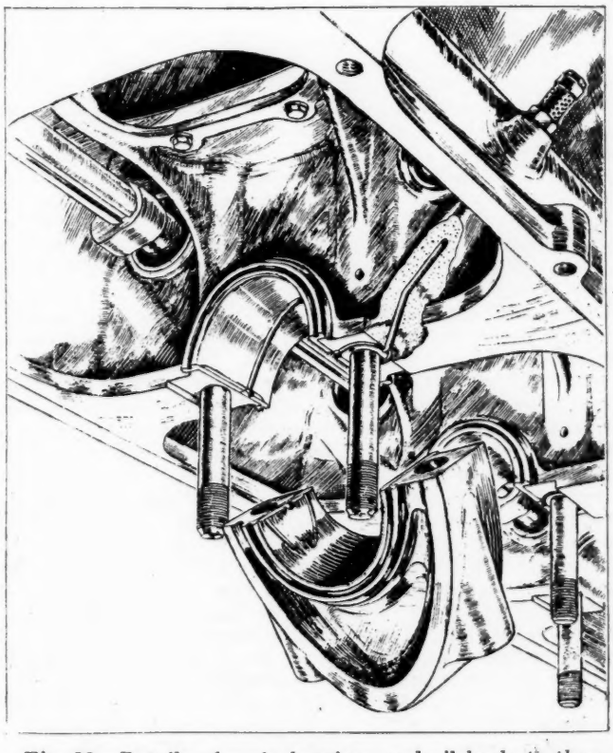


Fig. 22—Details of main bearings and oil leads to them

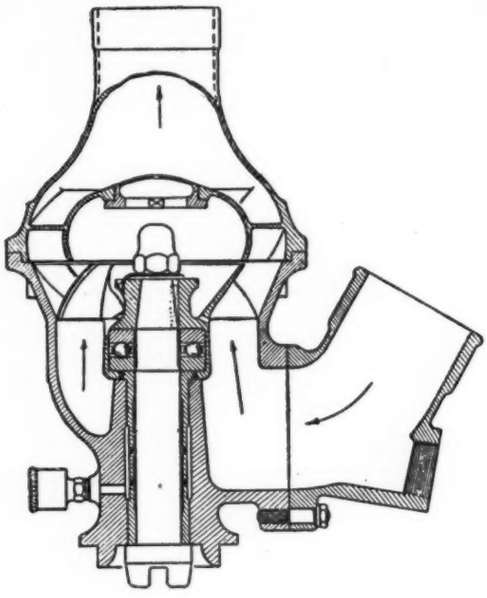


Fig. 23—Section through water pump

onal water pipe from the radiator is coupled by a rubber connection. The top half of the water pump body, which is a gun-metal casting, is formed with six helical passages leading in a reverse helical direction to the water pump rotor. These passages connect with the common vertical outlet passage in the top of the body casing as shown in Fig. 23. The outlet diameter is 50 mm. The center portion of the top body casting inside the helical passages above the pump rotor is domed and fitted with a threaded plug 38 mm. in diameter. This plug is drilled with a 3.5 mm. hole, evidently to prevent an air lock. Two 3 mm. holes are also drilled in the bottom of the rotor between the vanes for the same purpose. It is noticeable that the steel ball thrust race is working to all intents in the water flow, and must therefore suffer by corrosion.

Water Circulation

The circulation of the water cooling system is clearly set out in the diagrammatic drawing, Fig. 19, from which it will be seen that the water pump delivers directly into the bottom of the water jacket which surrounds the body of the rear carbureter. As already mentioned, the two carbureters are attached by long studs to the ends of the front and rear cylinders, and the water, after passing through the rear carbureter water jacket in a special passage round the throttle valve, enters the rear cylinder through the two circular water joint flanges. The water passes through the passages cast in each of the six cylinder heads to the front carbureter water jacket, whence the water is forced out through a vertical passage of 50 mm. diameter through a diagonal pipe leading to the radiator, which is slung above the engine from the center section of the top plane.

The radiator is of entirely new design and is shown in the photograph (Fig. 24) fitted to a 260-hp. Mercedes engine. Unfortunately, it has been impossible to carry out any tests on this interesting type of radiator, a separate report on which will be issued later.

According to a French report, this radiator is very efficient. It is of semicircular shape in front elevation, and is formed of hexagonal honeycombed tubes, and exceptionally deep in cross section, measuring 22 cm. The radius of the semicircle in elevation is approximately 32 cm.

The radiator is divided into two separate sections by a vertical baffle plate, as shown in the diagram, Fig. 24. Water enters the bottom of the left-hand side of the radiator through the pipe leading from the front carbureter, and flows upward through the tubes of the left-hand of the radiator to the top portion of the tank which completely surrounds the radiator. The water passes over the top of the dividing baffle plate, through the right-hand section to the bottom of the radiator, and out at the rear side, which is connected with a 50 mm. pipe to the inlet passage of the water pump.

As will be noticed, the front of the radiator is fitted with a blind, which is operated by a cable from the pilot's seat.

The two Bosch ZH-6 type magnetos are mounted on brackets cast on the rear end of the base chamber, and are driven at 1.5:1 engine speed directly off the rear end of the camshafts. The ignition point is set 38 deg. early. Two Bosch 3-point plugs are somewhat inaccessibly fitted in the head of each cylinder between the twin water connections as previously described. The plug bosses are water cooled. The high-tension cables are carried in fiber tubes bolted to the cylinders, and the leads to the plugs are taken through fiber blocks mounted on the sheet-metal brackets on the cylinder heads.

Order of firing—1-5-3-6-2-4.

Carbureters

The two carbureters are attached to the heads of the front and rear cylinders, as already described, and their general construction is shown in the cross-sectional drawing, Fig. 26. The carbureters follow the distinctive principles of the well-known Maybach design, but are slightly modified in many of their details as compared with the earlier engines.

These carbureters are designed to be used in conjunction with a fuel pump system, and in place of a float chamber employ two small constant-level overflow tanks inside each carbureter. This method obviates the necessity for using pressure release valves in the fuel system. Referring to the sectional drawing of the carbureter, Fig. 26, they are constructed of a cast aluminum water-jacketed body, in the center of which is mounted the rotary barrel-type throttle, open on one side to the curved passage to the induction pipe, and on the other to the mixing chamber above the jets. The main air supply is taken through a passage cast in the aluminum carbureter body directly below the throttle, and the extra air supply is automatically controlled by a guillotine type shutter, which works vertically just in front fo the jet control lever. The throttles of both carbureters, together with the mechanically controlled jets and the extra air shutters, are all interconnected.

The working principle of the carbureters and the functions of the various parts are more clearly demonstrated in the purely diagrammatic sectional drawing, Fig. 25, which is, to a great extent, self-explanatory. Fuel is delivered by the fuel pump into the small tank *A* of each carbureter through a restricting jet *B*, shown in the diagram. The fuel in these small tanks or reservoirs is kept at a constant level by means of the overflow pipe *C*, which leads back to the main fuel tank, via the small lower tanks *D* below the jets which are supplied through the pipe *E*. An air vent *F*, fitted witd a baffle plate, is provided in the top of the constant level tank *A*, which is also connected to the main fuel tank by a pipe *G*, leading to a hand fuel pump, or may be plugged and not used, as was the case in the Rumpler biplane. The main and pilot jets consist of two holes drilled in the top cover of the lower reservoir *D*, and are similar in principle to the White & Poppe jets. The area of the jet openings is mechanically controlled by means of a small hole drilled eccentrically in

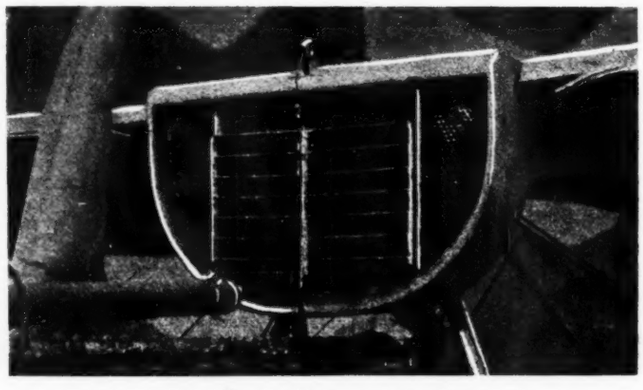


Fig. 24—Radiator and shutter

the jet cap *H*, which, as previously described, is connected by levers to the throttle and air control levers. The function of the top tank *A* is apparently to deal with the large excess of fuel delivered by the fuel pump at high speeds, while the lower tank, which is gravity fed, provides a constant fuel level for the jets.

The mixture strength at any point on the throttle curve is governed by purely mechanical means, there being no venturi of special jet arrangement. The jet depression is obtained by restricting the air flow at what approximates to a sharp-edged orifice; consequently the loss through the carbureter is very high compared with a carbureter using a venturi tube to get the jet depression.

Contrary to usual practice, the jet depression actually increases on throttling down, the depression being about four times as great at half throttle as at full throttle.

Control Adjustment

When running slowly, the throttle is slightly open, the supplementary air port closed, and the air shutter practically closed; in this position the small or pilot jet only is open. On opening the throttle, the supplementary air port commences to open in conjunction with the throttle opening. The main air shutter automatically opens in proportion, admitting more air, which passes directly across the top of the jets, and the jet area increases until the main jet orifice is fully open.

Owing to the interconnection of the control levers, there comes a point when the supplementary air port area increases

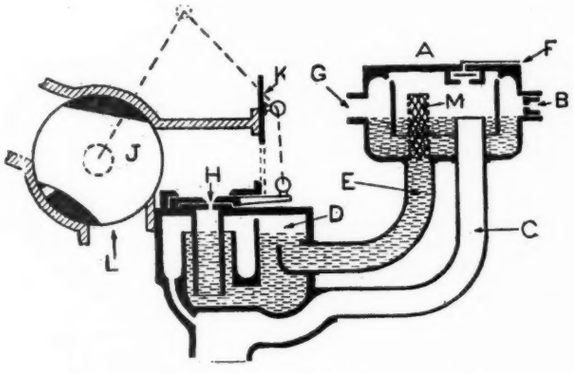


Fig. 25—Diagrammatic sketch of carbureter

out of all proportion to the increase in the jet area, the latter reaching a limit with no further increase by reason of the arrangement of the levers. This point represents the opening for maximum power at ground-level. If the throttle is opened beyond this point, the air supply rapidly becomes out of proportion to the jet opening and fuel supply. By this arrangement a simple form of altitude control is provided.

The various positions for "slow running," "slow speed," "full speed" and "altitude" are marked on the body of the carbureter, and are indicated by a pointer attached to the throttle lever of the rear end carbureter. By means of these markings on the carbureter the correct settings of the throttle lever can be checked when the engine is installed in the machine.

The translation of these markings on the carbureter is as follows:

LE = Leer = Running Light.
LA = Langsam = Slow Speed.
V = Voll = Full Speed.
H = Hohe = Altitude.

The induction pipes are aluminium castings and are of exceptionally neat design, being, as shown in Fig. 3, joined together in one straight pipe. A cast aluminium baffle plate drilled in the center with a 20 mm. hole is provided in the center of the two induction pipes between the front and rear three cylinders. This baffle is evidently fitted to equalize the gas supply to all cylinders.

Fig. 27 clearly shows the construction of the interesting type of band clip which is used for making the connections

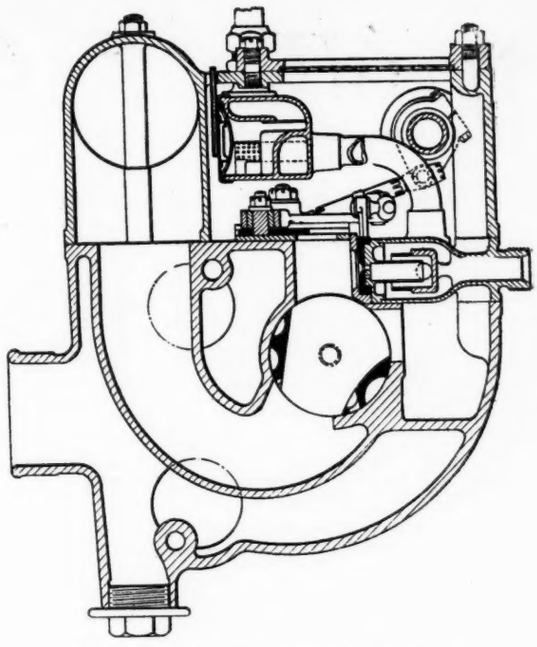


Fig. 26—Sectional view of carbureter

in the induction pipes, and also for most of the water joints on these engines. These clips are now extensively used on all enemy engines. The method of using these clips is herewith reprinted from the previous report on the 230-hp. Benz engine.

The clips are made of thin strips of annealed spring steel; these are wound twice round the rubber rings and fastened by small steel links and bolts. In starting to make this joint, the end of the steel band is first bent over the bottom bar of the connecting link, and then wound twice round the rubber ring, the free end of the steel band passing through the center portion of the connecting link on the second winding. The end of the steel band is then fastened to the top end of the link by coiling the end several times round the small bolt in the head of the link, the end of the steel band being bent over for about 2 mm. and inserted into a slot cut in the bolt, so that by turning the bolt in the link the steel band is wound tightly round the ring joints, and owing to the position and shape of the link, remains fixed.

(To be continued)

IT is stated that during a recent French offensive the consumption of gasoline for the army and air service was at the rate of 1800 tons per day, which represents a daily consumption of approximately 500,000 gallons of gasoline.

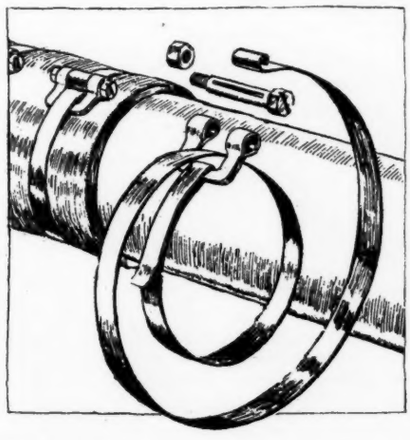


Fig. 27—Sketch of spring hose clip and details

The FORUM

The Magneto Patents Situation

By C. W. Curtiss

General Manager, Splitdorf Electrical Co.

THE Federal Trade Commission having granted the Splitdorf Electrical Co. a license under certain Bosch patents, various conflicting notices have appeared in the press concerning the matter.

It is true that the Splitdorf Electrical Co. has been granted a license by the Federal Trade Commission to use two United States patents owned by Robert Bosch of Stuttgart, Germany. I do not believe these patents have been used to any extent by the Bosch Magneto Co., of Springfield, Mass.

Splitdorf Electrical Co. was ordered to make use of these patents by the Secretary of War at the direction of the President of the United States in connection with magnetos for war airplane purposes. The patents do not relate in the remotest degree to the principle of construction embodied in the Dixie magneto which is made under numerous United States and foreign patents owned or operated under by the Splitdorf Electrical Co. only.

The Bosch patents in question relate merely to details, standard practice abroad, which the Government authorities wanted for the following reasons:

Interchangeable Binding Post

Patent 1,030,817 relates to a binding post for connecting electric cables. This is a detail of construction commonly used abroad and with which European aviators and mechanics are familiar. Naturally by incorporating this detail in the Dixie magneto, cables on foreign magnetos would then readily interchange with the American product, and probably for this reason the Splitdorf Electrical Co. was instructed to use this patent. There are many other ways of attaching a cable to a magneto, and some of them covered by the Splitdorf patent applications pending may even be preferable to the one shown in the patent, but as this was already being used abroad, it was adopted as standard here. The accompanying figure taken from this patent shows the Bosch type of binding post employing a pointed screw piercing the conductor and securing it in place in the insulated brush holder or distributor.

Hand Magneto for Starting

Patent 1,014,824 relates to an ignition system, wherein a high tension starting magneto is connected to the main magneto in such a way that the starting magneto may be operated by hand in order to furnish a starting spark. The accompanying figure from patent 1,014,824 shows this arrangement.

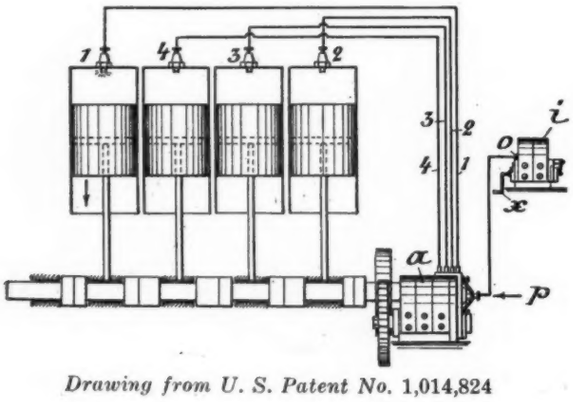
The main magneto A is connected to the spark plugs in the usual manner. From the distributor of the main magneto a cable P is connected to the starting magneto I and when the latter is rotated by means of the crank X high tension current will flow into the distributor of the main magneto where it is distributed by means of an auxiliary brush located behind the usual moving brush of the distributor, thereby being connected to whatever cylinder is under compression, and in no way relating to or interfering with the functioning of the main magneto. As soon as the engine has started, the service magneto A operates in the usual manner, the hand starting magneto I being stopped. This arrangement of using a hand starting magneto is standard on many foreign airplane engines, and it was desired to have the American practice conform for the sake of uniformity. There are several other ways of accomplishing the same results, and this patent is not vitally essential to American needs, although its use is desirable for the reason stated.

Splitdorf Improved Magneto

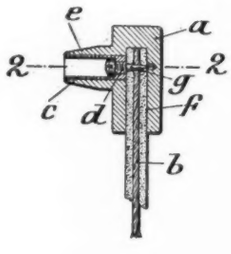
An improved method is shown in U. S. patent 1,260,985, property of the Splitdorf Electrical Co., by which method the high tension wiring to the starting magneto is eliminated and the arrangement simplified as compared to the Bosch patent. Splitdorf Electrical Co. has manufactured several hundred thousand magnetos for the Allies since the beginning of the war. The Dixie magneto has been standardized and is being produced in great quantities to meet the present emergency, the Splitdorf Electrical Co. now being the largest manufacturer of magnetos in this country.

In addition to furnishing magnetos direct from their own factory for war purposes, the Splitdorf company has arranged to permit the Bosch Magneto Co. of Springfield, Mass., and the Ericsson Mfg. Co. of Buffalo, N. Y., manufacturers of the Berling magneto, to make for war purposes only, and only for the duration of the war, certain Dixie magnetos under the Splitdorf Dixie patents; therefore three sources of supply for the Dixie magneto are available. In addition the Splitdorf company will furnish the necessary drawings and engineering information so that the product of all three factories will be standardized, uniform and interchangeable.

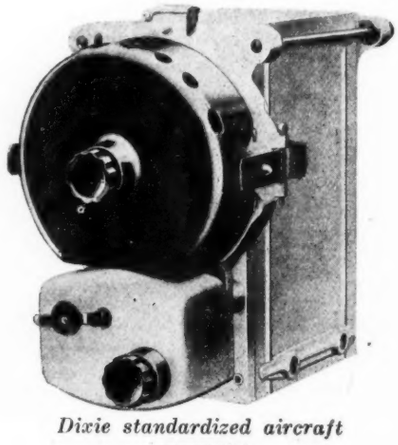
The standardized Dixie magneto enables one magneto to be used for 4, 6, 8, 12 and 16 cylinder engines, and 8 and 12, 45 degree cylinders, with a total of only 16 extra pieces to make up any one of the necessary assemblies. This arrangement, devised and developed under the direction of the Splitdorf company's chief engineer, Carl T. Mason, eliminates the necessity of having several types of magnetos and hundreds of repair parts therefor at the supply depots, and marks not only a distinct advance in the art, but is a notable example of an all-American contribution to winning the war.



Drawing from U. S. Patent No. 1,014,824



Bosch binding post (Patent No. 1,030,817)



Dixie standardized aircraft magneto

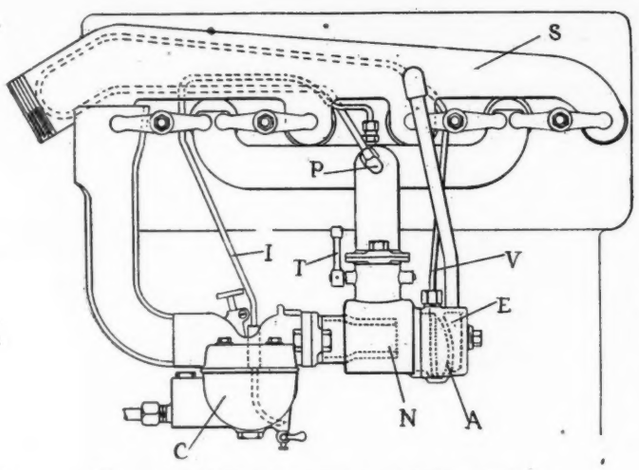


Fig. 1—California vaporizer fitted to engine

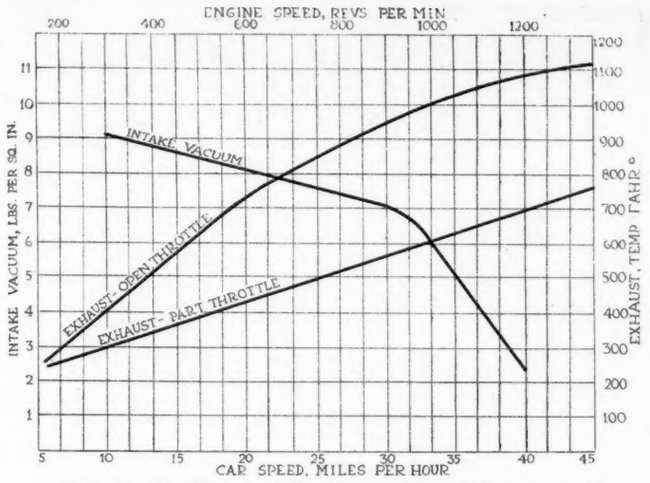


Fig. 2—Variation of intake suction with car speed

Kerosene Vaporization

By L. E. French

THE tube and the hot spot systems of vaporizing heavy fuels for internal combustion engines may be combined successfully in a single equipment, and the two effects may be automatically balanced in such a way that when one is at a minimum the other is at a maximum. This principle is embodied in a vaporizer for which the writer is responsible but which has not yet been placed on the market.

Referring to the illustration, Fig. 1, *C* is a standard carbureter which discharges its mixture through the nozzle *N* against the hot spot *E*. As the charge enters the expansion chamber *A* the lowering of its velocity causes the heavier particles to be precipitated and collect in the pocket at the bottom. The vaporizer tube *V* dips into this pocket, passes through the exhaust and discharges into the intake at *P*. The throttle being placed at the point *T* causes a difference of pressure between the two ends of the vaporizer tube. This draws air through the tube, together with the liquid and vapor collecting in *A*.

An idling tube *I* provides a vaporized mixture on closed throttle.

Fig. 2 shows the variation in the intake suction which occurs in an engine driving a car on a smooth, level road, and also the variation of the exhaust temperature. It will be noted that at the time the exhaust temperature is a minimum the intake vacuum is a maximum and vice versa. This has an important bearing on the action of the vaporizer. Where the hot spot system alone is relied upon, the surface heated must be made large enough to take care of the vaporization at the lowest exhaust temperature.

With the system in question, when the throttle is closed, there is a very strong suction on the vaporizer tube which draws the maximum quantity of air through the tube at this time. Thus when the exhaust temperature is down to its lowest point practically all the air of the mixture is heated by passing through this tube and the high velocity assists in breaking up the fuel. The more volatile particles of the fuel are evaporated on the hot spot *E*, while the less volatile are taken care of by the tube *V*. An experimental glass insert in the vaporizer tube has shown that the amount of liquid passing through the tube varies inversely with the volatility of the fuel being used.

On open throttle the increase in the exhaust temperature enables the hot spot to take care of a larger percentage of the evaporation.

In an article by Mr. Tice in the March 14 issue of AUTOMOTIVE INDUSTRIES he makes the following statement:

"In the case of kerosene particularly, the unsaturated hydrocarbon content is quite appreciable; and it is well known that among these substances polymerization, or the formation of resinous condensation products, occurs under these conditions. These latter leave a considerable and very obnoxious solid deposit when heated to dryness.

"The result is that with the heated passage method of progressive evaporation all this residual matter and whatever polymerization products may have been formed are brought to dryness within a comparatively small portion of the length of the passage. The obvious result is a deposition in the passage of solid matter. This reduces its efficiency as a heat transmitter, and increasingly reduces the capacity of the passage. Naturally the smaller the bore the sooner will it be choked to an extent to interfere with the functioning of the engine."

The apparatus with which Mr. Tice tried this experiment was no doubt one in which the velocity of the air through the vaporizer tube was comparatively low.

With the high suction and consequent high air velocity employed in the system in question there is no deposition of solid matters in the tube. This may be partly due to the constantly varying suction which would prevent the vaporization point from remaining constant. At all events, in a recent run from Cincinnati to San Francisco with this apparatus, where fuel was obtained in ten different States, there was no formation of solids in the vaporizer tube, although it is safe to assume that the bore of the tube was considerably less than the one to which Mr. Tice refers.

Tests of Benzol as Motor Fuel

(*Continued from page* 834)

at an average speed of 1077 r.p.m., during which run it developed an average brake hp. of 25.9. It consumed 13.2 gal. of fuel, which is at the rate of 2.78 gal. per hr. or 0.107 gal. per brake hp.-hr. This corresponds to a decrease in fuel consumption of 12.3 per cent as compared with gasoline. After the test was completed the engine was again taken apart for the purpose of determining the amount of carbon deposited on the pistons, valves, valve caps and spark plugs. The pistons were practically clean at the center, there being a little oil carbon around the edges. This was less than after the run on the mixture. There was a little carbon on the valve caps, but this was of such a texture that it could be easily removed. The porcelains of the spark plugs were clean and the inlet valve showed no carbon at all.

The test with 90 per cent benzol (motor fuel) showed that it was capable of giving a greater brake horsepower throughout the speed range of the engine than was obtainable with commercial gasoline. The increase varied from approximately 4.4 per cent at 800 r.p.m. to 19.4 per cent at 2000 r.p.m. Above 930 r.p.m. the fuel consumption with benzol was less and the engine ran more uniformly, and less carbon was deposited. The reason for the great increase in brake horsepower with benzol is thought to be the fact that it vaporizes more easily and that a mixture of benzol vapor and air burns completely and leaves very little carbon residue. Nothing was changed on the engine during the tests except the timing of the spark and the setting of the carbureter.

The tests further proved that a fuel mixture consisting of three parts of 90 per cent benzol and one part gasoline gave a brake horsepower equal to or slightly lower than that obtained with gasoline.

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The Outlook for Tractor Exports

FROM the beginning of the tractor industry in this country there has been a very gratifying demand for its products abroad. It is in the nature of things that farm tractors are needed most in newly developed countries where the individual holdings are large and the available farm labor is relatively small in amount. During the past two years the demand for tractors in England, France and Italy was so great that in spite of the great scarcity of shipping, the Governments of these countries found shipping space to carry many hundreds of tractors from here. When peace returns there will be an increased demand for tractors in every one of the countries which participated in the war, because of the enormous reduction in horses and farm laborers, and of the need for placing all available acreage in cultivation again as soon as possible. There are not wanting signs that this state of affairs is fully realized in the different countries. In France a national association of tractor manufacturers and traders recently held a demonstration to encourage the development of this branch of industry and large industrial concerns in other countries have had representatives here to study American practice in this field. With our lead of several years in tractor design, the urgency of the foreign demand and the obstacles to a rapid development of new industries in the war-ridden countries it should not be difficult for us to build up a large export trade in tractors.

Reform in Engineering Education

THERE has been a good deal of complaint in the past that the methods of instruction employed in our engineering schools do not meet practical requirements. The student is being taught a lot of principles and a lot of theory, but he is not shown the application of these to practical problems. The result is that when he graduates he is not fit to immediately enter upon responsible work, but must virtually pass through another course in the factory to learn the methods by which engineering problems are solved in practice.

A great deal of time is necessarily spent in engineering courses on such subjects as pure mathematics and theoretical mechanics. These are subjects in which the engineer should be well grounded, yet unless he is given opportunity to apply his mathematics and mechanics to practical problems during his college course he is apt to forget much that he learned before he has a chance to use it. There may be, later on in the course, instruction in machine design and on steam and gas engines, yet the application of the principles taught the student in his mathematics classes is not made sufficiently clear to him, and as a result his mathematical equipment becomes largely a useless tool.

In the education of lawyers the same observation has been made. That is, the student is taught legal principles and precepts, but the connection between these and the cases that arise in the law courts every day is often not sufficiently obvious to make their application easy. To meet this condition the "case system" of instruction was introduced in law schools. The professor picks out a certain number of cases that have come up in the courts and analyzes them, showing how legal principles are applied in each.

It has recently been suggested that a similar method be used in engineering instruction. By collating a set of problems that come up in the work of the practicing engineer, analyzing these problems for the students and showing them how the solutions can be obtained by the application of mechanical principles and engineering data, the teacher could impart to his students, along with the fundamentals of mechanical science, their applications in everyday work, and the young engineer upon entering the drafting room or shop would then not meet with the same difficulty in utilizing the knowledge he has acquired that he often meets with at the present time.

The Necessities of Reconstruction Are at Hand

THE collapse of the Central Empires brings the end of hostilities. The work of reconstruction is at hand. There is no place in reconstruction for the wildly excited optimist who cannot wait to lay one stone carefully upon another.

There is no place for the pessimist who fears to go to work lest the design be changed after he has started, and there is just as little for the reactionary who must let everything drift in the hope of Providential intervention.

It is a time for confidence.

Confidence, which springs from the belief that man is greater than his machines.

Confidence, which knows that industrial machinery, financial systems, methods of trade are but the tools with which the spirit of man works out its purpose.

Confidence, which springs from sanity of thought, clear planning and careful action.

It is to you, industrial leaders, manufacturers, engineers, constructors of all kinds, that the country must look for that courageous confidence and careful operation which characterized the building of our industrial supremacy.

It is your influence—so much larger than you imagine—your reputation for practical wisdom, which must be exerted to impress on employee, dealer, neighbor and all business men the fact that the serious problems of reconstruction will presently vanish if they are vigorously tackled.

Your influence and action should express that faith which can actually move mountains of difficulty—faith in our citizens, faith in our country and faith in our industrial ability.

The new structure of American industry must be more beautiful, more permanent, more useful.

The difficulties of its building are but the opportunities of its builders.

It is time to be ready, feet on the ground, stable and solid, facing the problems confident of ability to overcome them.

□ Latest News of the

8 Months for Plants to Come Back

Manager Reeves of N. A. C. C. Estimates This Time Will Be Necessary

NEW YORK, Nov. 8—It will take the motor car manufacturers as a whole about nine months to get back to 100 per cent production, stated Manager Alfred Reeves, of the National Automobile Chamber of Commerce, to-day. Getting out of the war will be almost as big a job as getting in.

Factories now, he said, have not stocks sufficient for production and would have to acquire new stocks before production could assume any great proportions. The return to normal would be gradual. The factories, which now are at 50 per cent or less, would come back by degrees and would hit first 50 per cent, then 75 per cent and then 100 per cent. This means that before-the-war production cannot be expected much before next September.

Schwab is said to be turning back 30 per cent of his ship steel, which he is unable to use because of the status of the shipyards, due to various causes.

Steel, Reeves believes, will be rationed for some time during the beginning of the peace period.

Many of the manufacturers have, during the lull in normal manufacture, been experimenting with new engineering and body designs, and, while before-the-war models might come through in a few months, the new designs could not be expected in quantity before the end of next summer.

At a meeting of the Chamber directors yesterday statistics produced showed the industry to have shipped on a 48 per cent basis in September and on 40 per cent or less during October.

In September the carloads shipped were: 1917, 20,538; 1918, 9900. October: 1917, 21,403; 1918 (incomplete figures), 8000.

Roy Chapin reported that at the elections the road bonds of Pennsylvania for $50,000,000 and of Illinois for $60,000,000 were carried, to pull both States "out of the mud."

It was coincidental that the day war was declared the Chamber was in session, and wired the Government an offer of co-operation for war work. Yesterday while the Chamber was meeting the United Press report of peace came, which later proved to be unconfirmed, and the Chamber at once wired an offer of its services for reconstruction.

Manager Reeves, who has maintained his home in Yonkers, N. Y., just outside New York City, and a war residence in Washington, has removed his family to the Capital, and will reside there permanently until developments warrant his return.

Reeves expressed gratification at the co-operation effected a few days ago in Washington when representatives of the car makers, parts makers, jobbers and dealers entered into a joint session on war problems.

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Peace and the Motor Stock Market

NEW YORK, Nov. 14—Any anticipations that the signing of the armistice would result in a wave of buying throughout the country generally have proved unjustified. The usual rises or falls of a few points in leading motor stocks have occurred, but there has been nothing in the way of spectacular dealing and it seems likely that everything will continue on a normal basis until such time as the market adapts itself to the new conditions.

It is conceivable that the uncertainty surrounding the steel situation in view of the amended statement that France is likely to need at least 10,000,000 tons for reconstruction work has had its effect, despite the announcement that passenger car manufacturers would benefit materially and immediately by the revision of priority orders covering the supply of raw material.

Reconstruction schemes also may have a far-reaching effect on the post-war plans of the automotive industry.

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Washington S.A.E. Section Formed

WASHINGTON, Nov. 13—A Washington section of the Society of Automotive Engineers was inaugurated here tonight at a meeting of members of the society and guests when it was voted that a petition asking the creation of the section be presented to the parent organization. The meeting was attended by several hundred and presided over by Herbert L. Chase. Discussions about the value of a section and its co-operation with the Government were combined with talks on internal combustion engine work in the Army and Navy by officers present at the meeting. Temporary officers were elected for the section as follows: Colonel James Furlow, Motor Transport Corps, temporary chairman; Orral A. Parker, Division of Military Aeronautics, temporary vice-chairman; Herbert L. Chase, temporary secretary, and Arthur B. Cumner, Washington representative for the Autocar Co., temporary treasurer. Dec. 11 was set as the date for the next meeting.

(*Continued on page* 860)

ReconstructionBody Proposed

President Considering Formation of Commission to Supervise Industrial Transition

NEW YORK, Nov. 14—Reconstruction of industrial activities undoubtedly will be one of the greatest problems with which manufacturers will have to contend, now that the signing of the armistice with the Central Powers has become an accomplished fact. Already there have been grumblings of discontent from labor. Telegrams are pouring into Washington from manufacturers throughout the country who are anxious regarding their workers and regarding the contracts for which they are obligated to the Government.

Just what steps will be taken to clarify the situation, and to insure the release of thousands of workers from war work and their transfer to other industries, it is too early to predict. Some inkling of how this may be accomplished, however, comes from Washington, where it is stated that President Wilson already has under consideration the appointment of what is termed a Reconstruction Commission. It would be the duty of such a commission to develop a program for the conversion of the country's business from a war to a peace basis. Should such a commission be appointed it likely would be advisory rather than executive, with its plans to be carried out by existing government departments.

It is stated that consideration being given such a commission includes representation of commercial, industrial, labor, agricultural and social interests. It is thought that such a commission, composed of men thoroughly qualified to handle the complex problems of the situation, could lay down a program which would be more satisfactory, both to capital and labor, than any program that might be arranged by a congressional committee.

Along with the telegrams of inquiry which are reaching Washington are coming hundreds of suggestions for means of transferring war labor to peace labor without too much of a jolt. It is suggested that the reconstruction committee might operate not only in formulating a plan but also as a clearing house for such suggestions. It would take up, in addition to the adjustment of labor problems, the distribution of war materials at present contracted for, or in the hands of manufacturers with war contracts, so that supplies could be equitably distrib-

(*Continued on page* 860)

Automotive Industries

Tractor Curtailment Order Is Modified

American Tractor Association Succeeds in Having Restrictions on Smaller Makers Reduced—Want Official to Pass on all Tractor Matters—Would Eliminate Converters

WASHINGTON, D. C., Nov. 12—Manufacturers of farm tractors who have new designs ready for the market are to be permitted to go ahead with the development of their plans, and under a ruling which has been obtained by the War Service Committee of the American Tractor Association, they will be assured of such production as will secure them a place in the trade during the coming year.

Following conferences between this committee and the Priorities Division of the War Industries Board restrictions curtailing the production of tractors during the year ending Sept. 30, 1919, have been very materially modified.

Instead of limiting the larger manufacturers to 75 per cent of the iron and steel used in the previous year and virtually cutting off the smaller manufacturers, the new regulation gives the small men a fair chance to develop while conditions affecting the larger makers are not greatly altered.

The revised ruling secured through the efforts of the American Tractor Association and issued over the signature of Judge Edwin S. Parker, Priorities Commissioner, follows:

The New Regulations

(a) That the tractor makers who have produced less than ten tractors during the first period (year ending Sept. 30, 1918), are in the primary experimental stage, and that they are not to produce more than twenty tractors during the second period (year ending Sept. 30, 1919). Provided, however, that such tractor makers as have, prior to Nov. 1, 1918, contracted and placed absolute orders for a substantial portion of the parts for more than twenty tractors for delivery during the second period may produce such number of tractors (not exceeding 100) as may have been so contracted for and ordered.

(b) That the tractor makers who have produced and had in field operation ten or more tractors during the first period are in the secondary development stage, and that they are not to produce more than 100 tractors during the second period.

(c) That makers of tractors other than farm tractors, whose development stages shall be comparable to those of the tractor makers described in the preceding paragraphs are to produce according to the same rules.

(d) That tractor makers who have produced and sold more than 100 tractors during the first period, and all other manufacturers of farm operating equipment who are past their primary and secondary development stages, will receive during the second period not exceeding 75 per cent of their receipts of iron and steel during the first period; provided that the tractor makers described in this subdivision may produce at least 100 tractors.

The revised decision not only assists the smaller manufacturers of tractors but also helps the makers of parts. Many of these who are depending upon new tractor concerns, many of them already having large contracts for parts which had necessitated considerable increases in manufacturing facilities, instead of facing a large and certain loss of business and money, will now be able to protect themselves at least in part.

The case presented by the American Tractor Association set forth the foregoing facts and substantiated them by an array of figures secured through a questionnaire which was sent out to tractor manufacturers and parts makers by the association. The returns from this questionnaire were collated and tabulated, and presented such conclusive evidence in favor of the demands of the association that in simple justice a revision could not be denied.

The requests of the association were formulated in a brief which was presented to the Priorities Division at a hearing before Rhodes S. Baker, Assistant Priorities Commissioner. These were summed up under five heads, as follows:

The Association Requests

1. An official to be appointed by the War Industries Board to pass on all matters pertaining to farm tractor production and distribution, and allotment of materials.

2. A Farm Tractor Committee, to be representative of the entire farm tractor industry, including manufacturers of finished tractors, tractor parts and tractor accessories, to be formed to co-operate with this official.

3. A ruling to be made on the number of tractors of each model to be permitted to be manufactured by each concern, with due regard to the amounts of actual capital invested and available for use in the tractor business.

4. A ruling to be made to prohibit entirely the manufacture of attachments for converting automobile and motor trucks into tractors for farm use.

5. Inventories as of Oct. 1, 1918, to be submitted in itemized form to the Government tractor official, together with all other information that will enable him to make an equitable allotment in each case.

Not all that was asked for by the association was granted. Neither was it altogether denied. In a letter from Mr. Baker to B. F. Sprankle, chairman of the War Service Committee of the association, after expressing regret that the Priorities Division could not grant all the modifications of Circular 35 asked for, he continues: "Your committee, however, may feel free at any time to bring the matter to us again for reconsideration if, in your judgment, war conditions or the war program shall be substantially different from the present."

Expect Further Modification

Since this letter was written, the armistice with Germany has been signed and the war has ended. War conditions are "substantially different," and the War Service Committee believes that the war program also will be different in the near future. This emboldens individual members of the committee to predict that while it may be some time before it can be announced officially, nevertheless it is practically certain that further concessions will be granted to the manufacturers of tractors. Indeed, some go the distance of asserting that it will be perfectly safe for tractor manufacturers to go ahead in furtherance of their plans as made prior to the original restrictive ruling of the Priorities Board, confident in the belief that the radical change in war conditions will permit of the early removal of all sorts of restrictions on industry.

One of the projects which the association will push is that of a permanent tractor and parts exposition, to be located on the first floor of the Joseph Leiter building, south of Van Buren Street on State Street, Chicago, formerly occupied by Siegel, Cooper & Co. The step preliminary to bringing this project before the members of the association will be taken up at a meeting of the executive committee, which will be held in Chicago the latter part of this week.

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Propose S. A. E. Meeting Jan. 13-14

NEW YORK, Nov. 14—Plans are maturing for a January meeting of the Society of Automotive Engineers. The sentiment is in favor of such a meeting which might be made to cover a great many technical subjects devoted to post-war activities. The thought is to make this gathering a real war work meeting. The dates tentatively suggested are Monday and Tuesday, Jan. 13 and 14. It is proposed to have a general meeting of the Standards Committee on Sunday, Jan. 12 and the usual dinner on Tuesday evening, Jan. 14. In all probability the meeting will be held at the New York headquarters of the Society, The Engineering Societies Building, 29 West 39th Street.

September Exports to Latin America

New York Ships Automotive Products Valued at $1,205,359

NEW YORK, Nov. 11—During the month of September 651 passenger cars valued at $784,670, 70 trucks valued at $114,257, and parts to the value of $306,432 were exported from this port to Latin American republics. The aggregate value amounted to $1,205,359, a gain of 4.7 per cent over that of the previous month, and one of 10.7 per cent over the average monthly total for the first nine months of 1918.

From January to September, 1918, inclusive, automotive products valued at $9,799,733 were exported from New York to Latin-American ports. The figures have not been limited to this total by lack of orders, as conditions are excellent throughout South and Central America, and the demand for cars, trucks and parts is increasing rapidly. There is still a shortage of transportation, but our shipbuilding program provides for greatly increased accommodation in the near future, and it is therefore reasonable to expect that our trade will increase very appreciably as soon as more vessels are available.

Chile, the country of nitrates, is our best buyer of passenger cars. Cuba leads as a truck purchaser, and Argentina is a long way in front of the others as a buyer of parts.

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New South American Export Rules

WASHINGTON, Nov. 11—Export shipments for the eastern coast of South America, including Brazil, Uruguay, Paraguay and Argentina, will be licensed under new regulations, following Nov. 18, 1918, by which the various shipments will be marked for preferential or non-preferential treatment by the War Trade Board. The new ruling applies to the shipment of all commodities except coal, coke and fuel oil.

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Revoke Chrome Import Licenses

WASHINGTON, Nov. 9—All outstanding licenses for the importation of chrome ore except those covering shipments from Cuba, Canada and Brazil, are revoked after Nov. 11, 1918. Hereafter no licenses will be issued for the importation of chrome ore except licenses covering shipments from Cuba, Canada and Brazil.

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Individual Rubber Import Licenses

WASHINGTON, Nov. 11—All articles manufactured of rubber and imported from Canada or Newfoundland will hereafter require individual import licenses from the War Trade Board.

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Permit Iron Ore Imports

WASHINGTON, Nov. 11—The War Trade Board announces in a new ruling that licenses will now be issued for the importation of a maximum total of 70,000 tons of low phosphorus iron ore from Spain, Sweden, Norway and North Africa, provided the maximum is imported before July 1, 1919. This amount permitted to come forward will be allocated by the Bureau of Imports.

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Campaign to Save Oil

WASHINGTON, Nov. 8—A campaign to save oil has been inaugurated by the United States Fuel Administration calling attention to the oil that is wasted by leakage. The campaign was started by mailing thousands of letters to oil producers and consumers. Following is the statement:

Dear Sir, "Save Oil":

A recent inspection conducted by one of the largest railway systems in this country developed that 25 per cent of all barrels containing oil were leaking, many of them wasting large quantities. It is not the waste of this oil alone, but there are thousands of dollars of damage done to foodstuffs and other merchandise caused by these leaking barrels. Leakage of this nature, occurring on all the railroads handling barreled oil shipments throughout the United States results in thousands of gallons of oil being daily wasted.

The conservation of oil is a war necessity and is therefore of great importance. I trust that you will give due consideration to every possible way by which your cooperage can be put in the very best condition and thus reduce the leakage loss to the minimum. It has been noted that second-hand wooden barrels are, in some cases, being used after being repainted without being given the necessary attention of recoopering and that iron and steel barrels are not being properly sealed.

I earnestly hope you will give your wholehearted co-operation in this matter and in every way endeavor to "stop the leaks and save the drops."—United States Fuel Administration, Oil Division, W. Champlin Robinson, Director of Oil Conservation.

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Importation of Nickel Matte

WASHINGTON, Nov. 11—Nickel matte can now be imported from Australasia provided it is used as ballast in sailing vessels carrying wool and that the maximum quantity to be loaded in any one ship will be 15 per cent of the deadweight carrying capacity of such ship.

To Discuss Problems of Reconstruction

Conference of War Service Committees Will Meet at Atlantic City

WASHINGTON, Nov. 9—Preliminary plans for the War Emergency and Reconstruction Conference of War Service Committees to be held at Atlantic City, Dec. 4, 5 and 6, are announced by the Chamber of Commerce of the United States.

Reconstruction will be given a prominent place on the program, as it is recognized this subject must be taken up by business men to the end that there may be placed at the command of the Government all available sources of information. The work of reconstruction suggests the creation of a federation of all war service committees that whatever study and planning is carried on may be on behalf of all business. War industries and non-war industries are concerned equally in the determination of reconstruction problems. All European countries already are under way with reconstruction plans.

The Atlantic City conference, a call for which was sent out last week by the War Service Executive Committee of the Chamber of Commerce of the United States, will include four general sessions and numerous group and committee meetings. Into the final session will be brought for final action all the proceedings of the meetings.

There will be four general sessions participated in by all the delegates. On Dec. 4 there will be both morning and afternoon sessions, and on the 5th and 6th morning sessions. The chamber is engaged now in obtaining the best speakers available to discuss among others the following suggestions: Reconstruction, industrial relations, raw materials and their control, price control, economic legislation affecting combinations, export and import operations, finance, etc.

The conference will be divided into groups at three sessions, the first to be held on the evening of Dec. 4, the second

EXPORTS OF AUTOMOBILES, TRUCKS AND PARTS FROM NEW YORK TO LATIN-AMERICAN COUNTRIES DURING NINE MONTHS ENDING SEPTEMBER, 1918

	Cars		Trucks		Value of
	Number	Value	Number	Value	Parts
Argentina	991	$1,065,823	33	$32,921	$1,135,144
Bolivia	11	15,191	2	9,000	4,850
Brazil	1,033	766,278	35	37,114	187,733
Chile	1,477	1,854,682	81	98,097	358,870
Colombia	99	69,711	1	600	20,197
Costa Rica	41	20,100	..	.....	1,034
Cuba	512	586,619	227	523,665	562,787
Ecuador	58	61,177	..	.....	6,243
Guatemala	5	8,099	1	322	2,704
Haiti	79	44,790	9	8,789	18,126
Honduras	20	19,927	..	.....	5,214
Mexico	179	177,407	34	74,110	56,507
Nicaragua	29	20,731	..	.....	1,150
Panama	48	39,043	28	19,623	29,983
Paraguay	1	2,500	1	875	768
Peru	450	549,301	57	126,535	69,910
Salvador	57	32,971	..	.....	3,731
Santo Domingo	193	149,022	12	10,100	31,415
Uruguay	1,107	619,355	11	11,000	117,156
Venezuela	95	74,652	5	15,900	40,181
	6,485	$6,177,379	537	$968,651	$2,653,703

on the afternoon of Dec. 5, and the third on the evening of the same day.

On the evening of Dec. 4 each war service committee will meet with its chairman to consider the problems of reconstruction as they affect that particular industry, as well as to take up other problems which the war has demonstrated are vital to industry.

On the afternoon of Dec. 5 the war service committees will meet in groups which are related as to their use of basic materials and as to their distribution problems, etc.

With these groups will meet the commodity or section chiefs of the War Industries Board. Related groups will form themselves into ten major groups on the evening of Dec. 5 to take up the question of raw materials, price control and subjects arising from related group meetings.

After the general meetings of the committees of the related groups and of the major groups it is hoped there will be presented definite recommendations covering the reconstruction period, with the possibility of creating an executive committee empowered to gather data and to function with industries to meet the many problems that the nation's industries will be called upon to solve with the end of the war.

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Automotive Dealers May Have Lights

WASHINGTON, Nov. 11—Garages, gasoline stations and all automotive dealers are again allowed to illuminate their store or shop windows in New England, New York, Pennsylvania, New Jersey, Delaware, Maryland, District of Columbia, Michigan and Ohio, according to a new ruling by the Fuel Administration.

Under the new order the store or shop window lighting is only restricted when the store is closed and then only on the "lightless nights." Throughout the rest of the country lighting restrictions have relaxed to the extent that they are left to the discretion of the State Fuel Administrators.

The new order prohibits the use of light for illuminating advertisements, announcements or signs or for the external lighting of any building and for displaying a shop window when the shop is not opened for business on Monday, Tuesday, Wednesday and Thursday of each week in New England, Maryland and the District of Columbia.

The order also provides for the entire discontinuance of such use of light Monday and Tuesday of each week in Michigan and Ohio, and in any other State where the Fuel Administration may so order.

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Driggs-Seabury to Redeem Bonds

NEW YORK, Nov. 12—All first mortgage 6 per cent gold bonds issued by the Driggs-Seabury Ordnance Co. (now the Savage Arms Corp.) other than those maturing Dec. 31, 1918, are called for redemption on Dec. 31 next at 101 per cent of the principal, together with interest.

Buda Engineers Test New Fuel

Dasey Says an Inexpensive Reworked Gasoline Will Be Soon Available

CHICAGO, Nov. 9—Passenger cars could be run 50,000 miles without the need for taking up a bearing, and truck engines would require much less repairing and would last much longer if they were all equipped with good air cleaners. This statement was one of two features of the discussion of a paper on "Lubrication and Fuel Tests on the Buda Tractor-Type Engine" presented by P. J. Dasey, sales and research engineer of the Buda company, to the season's first monthly meeting of the Mid-West Section of the Society of Automotive Engineers last night.

Another feature that made the engineers and dealers at the meeting sit up and take notice was Mr. Dasey's suggestion that there probably would be commercially available in a short time a new fuel—a re-worked petroleum product which would cost much less than gasoline but which, except for ease of starting and for extremely high-speed engines, has as good power and fuel economy characteristics as gasoline.

This product Mr. Dasey in his paper calls synthetic crude, and his paper was devoted chiefly to reports of careful tests in the Buda laboratories of this fuel in comparison with four other fuels, namely, gasoline, cracked benzine, cracked gasoline and kerosene. These tests were made on the new Buda tractor engine model HTU, whose normal speed is 1000 r.p.m., and using a standard Stromberg carbureter.

Summarizing the tests on these fuels and averaging the results of five runs on each fuel for power and economy at different speeds, he found the following in brake horsepower-hours per gallon:

	B.h.p.-Hr. per Gal.
Commercial Gasoline.....	7.80
Cracked Gasoline.....	7.92
Synthetic Crude.....	8.02
Cracked Benzine.....	8.23

The crying need for air cleaners, not only on tractors but on trucks as well, was emphasized. He stated that the Buda factory service men were required to send in samples of the crankcase oil every time they went out on a case of engine trouble. This oil was tested, and in practically every instance of piston scoring, bearing wear and similar troubles, the oil was found highly charged with dirt. It is his belief that the greatest immediate need of the truck field is the universal adoption of some efficient form of air cleaner.

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Motor Trucks Important in Haulage of Food

WASHINGTON, Nov. 8—That the world will look to America for food and that the motor trucks of the nation will be exceedingly important in hauling food supplies to shipping points, is the statement of Edward N. Hurley, chairman of the United States Shipping Board, in a letter to the Highways Transport Committee, in which he urges the committee to do its utmost to develop the haulage of food by trucks throughout this country. Following is the letter by Mr. Hurley:

Highways Transport Committee, Council of National Defense—Our merchant marine of to-day and to-morrow will carry a message of good will to the nations of the world.

Millions of cruelly starved folk face westward from every shore with mouths open to the promise of America. These must be fed—and then clothed—and also supplied with the other necessities of life. Our grand privilege is now here to restore life, strength and hope to these martyred brothers of a hundred tongues.

Food must start to flow quickly from every hill and through every valley of the great country behind our shores. Highways Transport must first carry supplies to shipping points before we can start our ships from the ports and fulfill our promise.

Highways Transport facilities at the farmer's gate—and at every farmer's gate—must immediately suggest the initial phase of ocean transport.

With the promise of the war's end before us the Highways Transport Committee throughout this land could and should render a peace-time service by stimulating highways transport of nourishment and supplies so badly needed. Routes and channels from country to shipping points must be opened up and be efficiently maintained. Resistance in any form to the free flow must be reduced and eliminated. Power and consequently more efficient utilization of man power must be brought about wherever possible.

The United States Shipping Board urges that this message be carried through you and your Regional Chairmen to the state organizations and down through to the great body of patriotic men whose vision can well embrace the crying need of their brothers in other lands for help.—United States Shipping Board, by Edward N. Hurley, Chairman.

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Joint Highway Meeting in Chicago

WASHINGTON, Nov. 11—A joint meeting will be held in Chicago Dec. 4 of the American Association of State Highway Officials and the Highway Industries Association. Highway and transportation experts will tell of the needs of road construction and of the value of the use of motor trucks for handling freight.

The feasibility of the bill introduced in the Senate by Senator Chamberlain and referred to the Committee on Military Affairs which provides the appropriating of $100,000,000 for the construction and maintenance of a system of national and State highways, designated to facilitate the movement of troops, equipment, munitions and supplies, will also be discussed at this meeting and plans made to assist in the enactment of it into a law.

This is the first concerted effort of these two bodies, and as there will be present from each State the highway commissioners, the men who really have great weight when it comes to enacting State highway regulations, the meeting should be fraught with much good.

Buda Develops New Tractor Engine

Similar to Truck Type but Has Detachable Head with Plugs Directly in Cylinders

HARVEY, ILL., Nov. 11—Just how the design of an engine for tractor service must differ from a truck engine is brought out in the new Buda tractor engine, known as the Model HTU. This is the engine used in the Parrett tractor.

The engine is fundamentally identical with the standard Buda HU truck engine, such as is being installed in the Nash Quad for government service. The only differences between the new HTU and the HU are those differences occasioned by the different needs of tractor service as compared with truck service.

The tractor engine, however, differs in that it is made with a removable cylinder head to permit greater accessibility for carbon removal and valve grinding, and more important, the spark plugs are inserted directly into the cylinder head castings, instead of passing through port plugs. This permits the cooling water to be brought up very closely to the spark plug, and also puts the plugs in a better location with reference to the combustion space. The water circulation can therefore be made more ample, with the removable cylinder head, a feature which is necessary under the continued full load conditions of tractor service.

Provision is also made for mounting the fan-driving pulley in front of the gearcase cover, accommodating a flat belt 2 in. in width, and a pad is cast integral with the gearcase cover, on which to mount a fan bracket. This extra large fan belt is provided for to give greater assurance of cooling necessitated by the fact that the tractor engine works at very nearly full load most of the time, and its "road speed" is so low that little assistance can be expected from that source. Lubrication through all bearings is made more certain, under field conditions, by having the oil pan divided, a feature which is not necessary in a regular truck installation. It is worth while, also, to call attention to the S. A. E. flange which is provided for mounting a starting motor, and the generator.

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To Build Fordsons in Mexico

TAMPICO, MEXICO, Nov. 11—It is stated here that the manufacture of Fordson tractors in Mexico will be done by a company which will be organized for that purpose under the laws of Mexico. The commission sent to Mexico by Henry Ford has made its investigations and returned to make its report, which it is understood is entirely favorable to the project.

It is expected that the engineers of the Ford Motor company will arrive in Mexico in about a month and that Monclova, Coahuila, will be the point at which the factory will be built, as it is the most favorable point at which coal and iron can be had for making the steel parts of the tractors.

Mexican products will be used in the manufacture of the tractors and Mr. Ford has declared that none of the money made in the business will be taken out of the country but will be used in increasing the output and increasing the wages and bettering the condition of the employees.

The championship banner that was presented last week to the Nordyke & Marmon Co., Indianapolis, for exceeding its October quota of Liberty engines by 246 per cent

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Illinois to Mark its Highways

CHICAGO, Nov. 9—Now that the direct reason for its formation has been brought to a successful conclusion, and the good roads bond issue has been approved by the voters of the state, the Illinois Highways Improvement Association will not cease its existence, but already has turned its attention to the matter of regulating the marking of the highways and replacing the present conglomerate, unsystematic method of signboarding the roads with some sort of systematic plan providing for standardized signboards giving definite information and on logical routes.

It is possible that a comprehensive plan similar to that the Wisconsin Highways commission has been putting into effect, will be adopted. William G. Edens, president of the Illinois Highways Association has this plan under consideration. In Wisconsin, all the main thoroughfares are officially designated by number, and signs bearing these figures inclosed in a triangle are to be found at frequent intervals along the roads thus far marked. Thus, a motorist driving from one town in Wisconsin to another, follows a route which bears the same number all the way.

Casting Metal Under Pressure

New Process Similar to Die Casting Developed—Greater Tensile Strength Obtained

NEW YORK, Nov. 12—A metal casting process similar to die casting, but employing much higher pressures and improving the physical qualities of the alloy has been developed by the Morris Engineering Co., 39 Cortlandt Street, New York. As compared with sand castings of the same alloys, castings made by the Morris process are said to possess greater tensile strength and increased density, and to be free from blow holes. The crystalline structure is said to be finer and the machinery qualities are improved.

By the Morris process the molten alloy is poured into metal molds and subjected to high pressure while congealing. Fuse bodies for shrapnel have been made by this process in large numbers, the alloy used containing 80 per cent aluminum and 20 per cent zinc.

Operations Automatic

The castings are made in an automatic machine which has a capacity of several hundred per hour. Various alloys have been used, including one containing 60 per cent of copper, 40 per cent of zinc and a trace of lead, which when cast by this process shows a tensile strength of 49,500 lbs. per sq. in., an elastic limit of 29,750 lb., and an elongation of 45.5 per cent in 2 in. Another alloy, containing 86.5 per cent of aluminum, 12 per cent of zinc and 1.5 per cent of copper, has a tensile strength of 42,700 lb. per sq. in., an elastic limit of 29,400 lb. and an elongation of 12.5 per cent in 2 in. In the case of the British fuse bodies referred to above, the specifications call for a composition of 80 per cent aluminum and 20 per cent zinc, which must show an elongation of 7 per cent in 2 in. It is stated that the average of 16 tests made on samples of this alloy produced by the Morris process showed an elongation of 14.47 per cent in 2 in., with a tensile strength of 41,440 lb. and an elastic limit of 30,400 lb. The quality of the castings obtained by this process may be judged from the statement made that in filling this order the loss due to rejections amounted to only 5 per cent.

The 90-10 aluminum-copper alloy used for the fuse bodies has been subjected to tests by the U. S. Bureau of Standards and the results compared with tests made on sand castings of the same alloy. Following is an extract from the report made by the Bureau:

"The 10 per cent copper-aluminum alloy as sand cast showed a normal tensile strength of approximately 20,000 lb. per sq. in., with an elongation of approximately 1 per cent (forged) as compared with tensile strengths of from 35,000 to 40,000 lb. per sq. in. and elongation of from 8 to 10 per cent of the same alloy when in the drop forged condition. The strength of the drop forging is almost

double, the ductility from 5 to 10 times as great, the toughness, therefore, from 10 to 20 times as great as that of the sand casting.

"Hard castings can be produced in sand or in dies but they are without exception brittle, having very little ductility."

Castings Under Pressure

Alloys of aluminum, copper and iron have been cast by this process which have desirable property of a low coefficient of heat expansion. Such an alloy is said to be well suited for use in internal combustion engine pistons, overcoming some of the difficulties due to the high heat expansion of the ordinary aluminum alloys. Tests of fragments from the frame-work of a Zeppelin show a composition similar to that employed by the Morris company, namely, 91.2 per cent aluminum, 4.13 per cent copper and 3.27 per cent iron. It is believed that the iron was introduced in this alloy intentionally and that it is largely responsible for the high tensile strength, about 40,000 lb. per sq. in. This Zeppelin alloy is similar to one recommended for engine piston cast by the Morris process, the composition being covered by U. S. patent No. 1,227,174.

It is believed that there will be a wide field for the new process in the manufacture of parts for aircraft and automobile engines which have to combine strength with lightness. It is claimed for the process that the physical properties and machining qualities are absolutely under control and that alloys can be handled by it which formerly were impossible. The process is covered by patents in the United States and all important foreign countries.

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Bituminous Coal Production

WASHINGTON, Nov. 12—Bituminous coal production for the week ended Nov. 2 was 10,965,000 tons, a decrease of 3 per cent, as compared with the preceding week, and practically equivalent to the production of the similar period of 1917. The decrease was caused by the influenza epidemic. Production of bituminous coal from April 1, 1918, to date was 368,858,000 tons, as compared with 326,421,000 tons in the same period last year, an increase of 42,437,000 tons.

Anthracite production for the week ended Nov. 2 was 1,500,000 tons, as compared with 1,714,000 tons during the preceding week, a decrease of 12.5 per cent.

Production during the week ended Oct. 26 was decreased from 100 per cent by labor shortage, 9 per cent; car shortage, 8.4 per cent; mine disability, 2.6 per cent; all other causes, 1.6 per cent; total, 21.6 per cent.

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Detroit Office for Lakewood

DETROIT, Nov. 9—The Lakewood Engineering Co., Cleveland, has opened an office in the David Whitney Building, Detroit. R. C. Kimball has been appointed district manager, and will cooperate with manufacturers in the solution of factory transportation problems.

Rubber Imports Gain in October

Tonnage for Month Well Ahead of September—Total for Year is Slowly Gaining

NEW YORK, Nov. 13—Imports of crude rubber took a considerable spurt during the month of October, the total tonnage coming in being 4358 tons greater than came in during September. October of this year shows a loss of 461 tons imported as compared with last October, though the total for the year up to date is slowly catching up to the total for the same period last year.

During the first 10 months of 1917 a total of 145,295 tons of crude was imported. During the same period this year imports totalled 140,641 tons, the difference being 4654 tons. This is substantially the amount by which the October imports this year exceeded those of September. Following are the statistics as compiled by the Rubber Association of America:

	1917 Tons	1918 Tons
January	12,788	16,084
February	10,162	13,108
March	18,624	17,161
April	13,000	12,703
May	18,411	16,288
June	15,096	24,124
July	17,290	16,092
August	17,290	10,421
September	13,664	5,151
October	8,970	9,509
Totals	145,295	140,641

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Dealers Gather for Implement Convention

OMAHA, Nov. 12—Dealers are coming in early for the tenth annual convention of the Mid-West Implement Dealers' Association. Convention will open officially at 9 o'clock to-morrow morning. Owing to conditions in this territory, past and present, a record breaking attendance is anticipated. An interesting program on the line with resumption of industrial activity has been prepared.

Tractors will occupy a prominent place on the program, but will be handled through the question box rather than by direct addresses. A large and representative display of farm operative implement and tractors is being installed in the Municipal Auditorium, and will be a big feature of the convention.

Included in this exhibit are tractors of the following makes: Nison, Allis-Chalmers, International, Moline, Wallis, Emerson-Brantingham, Avery, Appleton, Bull, Wisconsin, Cleveland, Parrett, Case, Huber, Advance-Rumley, Hart-Parr, Turner and Townsend.

The implement display covers most of the well-known makers of farm equipment on the market. The motor car interests of Omaha are well represented in the tractor display, as tractors are shown by the J. T. Stewart Motor Co., Noyes-Killy Motor Co., Jones-Opper Co., Nebraska White Co. and the Hanson-Tyler Auto Co.

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New Export Representative

NEW YORK, Nov. 13—Reed, Tilley & Co. has been formed with a capitalization of $60,000, and will operate as an exporter and foreign manufacturers' representative in South and Central America, Mexico and the West Indies. The company will deal principally in passenger cars, trucks, motorcycles, tires, accessories, tractors, farm lighting systems and electrical supplies. H. A. Reed is the moving spirit behind the new company, which includes Hector J. Tilley, of Tilley, Ramos & Co., and Rufus S. Cole, of the Robertson-Cole Co. The new company has acquired a controlling interest in Tilley, Ramos & Co., thereby acquiring an active branch at Santiago, Chile, in charge of Julian Ramos. The company will also handle the Latin-American business of the Robertson-Cole Co., including Roamer and Harroun automobiles, Reading-Standard motorcycles and Smith motor wheels. The company is also negotiating with other concerns for South American representation. It is planned to establish branch offices in Buenos Aires, Argentina and St. Paulo.

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Detroit S. A. E. to Hear Wardrop

DETROIT, Nov. 9—The Detroit Section, Society of Automotive Engineers, will hold its regular meeting at the Hotel Pontchartrain convention hall Nov. 29. A government film, "Process of Manufacture of the Liberty Engine," will be shown, after which G. Douglas Wardrop, managing editor of Aerial Age Weekly, who has just returned from France, will deliver a lecture on "The War in the Air."

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4800 Miles of Road for Illinois

CHICAGO, Nov. 8—Illinois will begin the construction of 4800 miles of improved roads immediately after the declaration of peace. This is the largest single road project ever proposed, and is made possible by the popular voting of a $60,000,000 bond issue by the people of the State at the election Tuesday.

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New Home for Highway Trailer

EDGERTON, WIS., Nov. 11—The Highway Trailer Co., Edgerton, Wis., expects to take occupancy of a large manufacturing addition made necessary by its extensive Government contracts before Dec. 1. The addition gives the company a building 500 ft. long and averaging 75 ft. in width. A new steam heating plant is being installed throughout the factory.

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American Road Builders to Meet in New York

NEW YORK, Nov. 14—The American Road Builders Association will hold its sixteenth annual convention in New York. The convention will open on Tuesday, Feb. 25 and close on Friday, Feb. 28. There will be technical sessions twice each day and a dinner on one evening.

U. S. Photographers' Fine Record

100,000 Prints of Aerial Photos in Four Days on Western Front

WASHINGTON, Nov. 8—Over 100,000 prints of aerial photographs had to be turned out in 4 days by the aerial photographic force of the air service during the recent offensive west of Verdun and in the Argonne region, according to an overseas report just received here. The aerial negatives had originally been made by French squadrons operating over the sector, but the production of prints on the large scale necessary had been left to the American service. As the offensive was in the nature of a surprise, all the preparatory work, especially the bringing up of American air squadrons, had to be concealed up to the last minute.

The American photographic force was brought together and travelled all night to headquarters, arriving at 9 a. m. By 10 a. m. a laboratory had been improvised in the shed of a brewery and the printing was actually in progress. During the first night, with most limited facilities, 3000 prints were made, and later a record of 9000 prints in 16 hours for a single photographic section established, the latter made possible only by carrying all the water in buckets from a considerable distance.

During the offensive the advance of the troops was so rapid that nearly all the planes and observers were occupied in making visual observations and regulating artillery fire. Aerial photographs, however, were made by the American forces of the results of heavy artillery fire, and proved very valuable. A photographic mission also was sent out along the Meuse to ascertain if reports were correct that all the bridges were down. The results were so good that the exact number of troops, trucks and even machine gun companies in movement at that hour was ascertained.

Valuable lessons were learned in this largest operation of the photographic section yet carried out overseas.

"All of this work," the report says, "was done under the crudest poss ble conditions, and the results speak very highly for the quality of our men, their ability, resourcefulness and endurance, for there was very little sleep for anyone during those 4 days, but the men all realized the importance of their work and took particular pride in it."

"Photographic sections will from now on be subjected to work under extremely difficult conditions. The area over which the advances are made is usually entirely torn up by the artillery and no shelter of any kind is available, transportation facilities are limited, barracks extremely scarce, and photographic sections often left to shift for themselves. The ingenuity and push of the photographic officer is taxed to the limit."

This report from overseas has given many suggestions for speeding up the training work in this country, particularly the constant references throughout as to the necessity of a highly skilled personnel. As a result the selection of men to train will be somewhat more intensive and an effort will be made to reach the very limited number of men already skilled in photography.

At present there is a shortage of properly skilled photographers. Several hundred men having a thorough knowledge of the manipulation of all kinds of cameras, both speed and view, laboratory work, photographic chemistry, lenses and the working of panchromatic plates are needed at once. Such men may be inducted through the Air Service Test Boards at the following places:

104 Broad St.....New York
Second and Market Streets....San Francisco
230 East Ohio Street.....Chicago
739 Boylston Street.....Boston
610 Locust Street, Security Bldg....St. Louis
Eleventh and Main Streets.....Kansas City
Old Armory Bldg.....Cleveland
Care of Postmaster.....Los Angeles
159 West Water Street.....Milwaukee
Chamber of Commerce, Commanding Officer, Cincinnati
Kelly Field .....San Antonio
Air Service Mechanics School, Overland Building .....St. Paul

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United Motors Formally Dissolves

NEW YORK, Nov. 12—The United Motors Corp. has ratified the plan under which this company is to be absorbed by the General Motors Corp. Under the terms General Motors will assume all liabilities and acquire the property of the United company in exchange for 110.164 shares of its common and 330,492 shares of its preferred stock. United Motors stockholders will receive for each 10 shares of stock 3 shares of General Motors preferred and 1 share of common. Cash is to be paid in lieu of fractional shares on the basis of 80 per cent per share for General Motors preferred and $125 for common.

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Postpone Metropolitan S. A. E. Trip

NEW YORK, Nov. 9—The trip of the Metropolitan Section of the S. A. E. to the Wright-Martin plant in New Brunswick, N. J., has been abandoned. The Long Island City plant of the company will be visited instead on November 30.

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Economic Aid to Russia

WASHINGTON, Nov. 8—The War Trade Board of the United States Russian Bureau, Incorporated, has been organized as a corporation of the United States to render unselfish economic aid to Russia. The capital of the corporation is placed at $5.000.000, the amount of the revolving fund which has been placed at the disposal of the War Trade Board for financing the plans and policies of economic assistance to the Russian people.

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Enlarge Camp Holabird Barracks

WASHINGTON, Nov. 9—To provide accommodations for 3000 additional men who will be stationed at the motor truck repair depot, officially known as the Mechanical Repair Shop Unit at Camp Holabird, Md., the Construction Division of the Army has been authorized to proceed with work which will cost approximately $798.000. Barracks will be erected and the water supply will be increased. Additional roads will be built in and around the camp.

Germany's Gasoline Cut Off

Armistice With Austria Stops All Supplies of Gasoline and Fuel Oil

WASHINGTON, Nov. 7—The armistice with Austria and the consequent stoppage of all traffic between that country and Germany will cut off all of Germany's supplies of fuel oil and gasoline, according to present information in the hands of the United States Fuel Administration.

Germany has been obtaining fuel oil and gasoline from Galatia and Roumania and was planning to import extensively from the oil fields of the Caucasus. She has no supplies of fuel oil within her own borders and has been using for lubricating oil a derivative of coal tar—benzol. This latter source, however, does not supply her wants.

Italy, which is entirely dependent upon outside source for its coal supply, will not be able to get coal from Austria which has hardly enough for its own use. Germany has in the past occasionally supplied Austria with coal. The Austrian coal mines when worked to full capacity furnish sufficient coal for that country's needs. During recent months, however, because of enfeebled conditions of the Austrian miners—due to lack of food—the coal mines have yielded only from 50 to 60 per cent of their full capacity. The miners have been forced to spend about 3 days of the week gathering such meager supplies of food as they could lay their hands on.

The demobilization of the army will permit the return to the mines of miners in good physical trim and there may be no great suffering in Austria because of lack of coal this winter.

The armistice also, it was pointed out, will relieve the food situation in Austria. In the army the soldiers have been getting much better food than they were accustomed to in civil life. Austrian coal miners, for instance, before the war ate meat only a few times a year, whereas they have been obtaining it daily in the army.

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Pierce Net Surplus $886,759 for 3 Months

BUFFALO, Nov. 11—For the 3 months ending Sept. 30, 1918, the Pierce-Arrow Motor Car Co. reports a net surplus of $886,759 after charges and war taxes are deducted. This is equivalent to $2.74 per share on the 250,000 shares of common stock after allowing for dividend requirements on the preferred. A year ago the earnings on the common stock during the corresponding quarter were $5.94 per share, but this figure was arrived at without deducting war taxes. Net operating profits for the 3 months amounted to $1,338,129, as against $1,809,729 for the corresponding quarter of 1917, a decrease of $471,600.

Contract Adjustment Board Created

Will Hear and Judge Claims Arising Under War Department Contracts

WASHINGTON, Nov. 7—A Board of Contract Adjustment has been created by the Secretary of War to hear and judge all claims arising under contracts made by the War Department. The board is clothed with all necessary powers.

Through the operation of the Board of Contract Adjustment contractors supplying the army will be able to submit any differences that may arise between them and the contracting officers of the various supply bureaus to this board, which will act without any of the technicalities of court procedure, thus insuring a speedy and equitable adjustment. The services of lawyers will not be necessary, as the contractor or his representative may appear before the board and state his case freely and fully with the assurance that he will be given an impartial hearing and a prompt decision. The decisions of the board will be final and conclusive on all matters submitted to it for determination, but appeals may be made to the Secretary of War.

The members appointed on the Board of Contract Adjustment by the Secretary of War are Lt. Col. Christpoher B. Garnett (chairman), Lt. Col. H. H. Lehman and Lt.-Col. Edward S. Malone. Lt. Col. Garnett was formerly chairman of the Corporation Commission of Virginia, Lt. Col. Lehman is chief of the Methods Section, Purchase Branch, Purchase, Storage and Traffic Divison, and Lt. Col. Malone was Assistant Corporation Counsel of New York City for the Borough of Queens. The legal adviser of the Board will be a Judge Advocate appointed by the examiners, who will be commissioned officers of the United States Army and appointed by the Director of the Purchase, Storage and Traffic Division. The office of the Board of Contract Adjustment will be in Washington, but hearings may be held in such other places as may be expedient and necessary for the proper performance of its duties.

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Army Charting Air Lanes

WASHINGTON, Nov. 11—The Air Service of the Army has commenced charting the air lanes over the United States. This work, started for a training of map makers for the A. E. F., it is expected, will be invaluable for the development of the Air Service for the future. The charts are mosaics made by stereopticon cameras showing all the landmarks such as waterways, railroads, cities and mountains for pilots to follow in their cross country flights. These courses are laid out according to the season of the year and depend considerably on the atmospheric conditions reported by the Government Weather Bureau.

At Kelly Field the instructors and the members of their classes work with the aid of the planes carrying the cameras; photographic lorries and motor trucks carrying the photographic material and supplies, and also a portable dark room for developing and printing the plates and films exposed. Such an outfit is usually set up in the district to be photographed in some town which has a landing field adjacent to it. The men employed in the work are rationed from this camp and the developing and printing of the films and plates delivered by the planes are all down here. As fast as one district or zone is finished the outfit moves on to the next.

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Aviators Receive Hospitality

WASHINGTON, Nov. 11—Cities and towns of the Southwest under the air lanes used by Army flyers are rivaling each other in their hospitality to aviators. They are building landing fields, organizing the inhabitants into reception committees and raising money for entertainment. One town, which calls itself "The Dynamo of Central Texas," is sending out invitations by cards to flyers. The cards read:

"Upon presentation of this card all courtesies will be offered you, including shower and pool baths at the Y. M. C. A.'s $87,000 plant, Country Club's $75,000 plant, Elks Club's $47,000 plant. Coffee and sandwiches will be handed out by the Red Cross canteens; hair cut, shave and shine given free at any barber shop; cold drinks at the soda water fountains, also local carfare."

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Liberty Engine Builders Form Association

INDIANAPOLIS, Nov. 11—The men and women building Liberty airplane engines have formed an association in which they pledge themselves to use every effort to keep production at its topmost point. Following the unveiling of a 10,000th motor at Detroit three weeks ago, the United States Liberty Motor League was formed. It now has a membership of over 25,000 workers, in some 600 plants, making Liberty engines and Liberty engine parts, and every day finds thousands more applications. It has been by means such as this League and other methods of keeping the airplane builders' energies at high pitch that the great increase in production for the last month was accomplished.

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Return Loads Bureaus in Canada

MONTREAL, Nov. 11—Arrangements are going ahead whereby the return load system is being got into tangible shape here; already arrangements are being made for a service between Montreal and Schenectady, taking in the entire route between these two points; it is also being arranged to put on a regular service between Montreal, Three Rivers and Quebec, in addition to a constant daily service around the entire Island of Montreal.

Army Motor Vehicle Control Unified

Motor Transport Corps to Operate All Passenger Cars and Trucks

WASHINGTON, Nov. 11—The pooling of the motor vehicle equipment of the Army under the control of the Motor Transport Corps has proved so successful in the District of Columbia, where it was first tried, as recently announced in AUTOMOTIVE INDUSTRIES, that the system will be extended throughout the United States.

All passenger and cargo-carrying vehicles are included in the order, the effect of which will be to give a more efficient motor transportation service for the Army with a greatly reduced equipment. Heretofore motor vehicles have been assigned to the various departments for their exclusive use. Under the new plan they will be operated under one control and for the benefit of all departments.

In Washington, where the need for passenger cars for official business is great, an elaborate taxi system has been established, consisting of 13 stations connected with an adequate system of telephones. Officers above the rank of captain are provided with cards entitling them to call Government cars when needed, for official business only. Junior officers and civil service employees must have trip tickets to gain the use of the special motor car service. A bus service, operated on schedule between the principal buildings occupied by Army organizations, provides transport over regular routes for officers and employees on official business.

These arrangements have made it possible to reduce the large number of motor cars formerly assigned to officers for their individual use to 23. Only the heads of departments, corps and bureaus are entitled to have cars assigned to them individually. The new system will reduce the motor equipment necessary for the Army's use by about 33 per cent. The vehicles released from domestic service will be available for overseas duty.

Joy riding, the evasion of State license fees by privately owned vehicles masquerading as Government cars and other abuses will be prevented by the rule requiring all army trucks, cars and motorcycles to be painted olive drab and stenciled on the sides and rear in block letters 4 in. high "U. S. A.," followed by the registration number assigned to the car in the office of the Chief of the Motor Transport Corps, and by the words "For official use only."

All chauffeurs will be limited service enlisted men, and will be under military discipline. A complete manual of their duties has been prepared. All persons making use of the motor car service are required to sign for each trip. This makes the use of the service for private

M.T.C. Organization Completed

Drake Now Head and Furlow Deputy Chief; Seaman in Executive Charge

WASHINGTON, Nov. 9.—The Motor Transport Corps under Brig.-Gen. C. B. Drake, which has charge of engineering, operation and maintenance of the motor vehicles of the Army excepting tanks and tractors, has completed its organization. General Drake is at the head with Col. James W. Furlow as Deputy Chief, supervising the executive maintenance, engineering and liaison divisions. Lt.-Col. B. F. Miller is the assisting deputy supervising property and operating divisions. Lt.-Col. Edward Orton, Jr., is in charge of the service division.

Col. A. O. Seaman of the General Staff is in charge of the executive division, controlling administration, personnel, training, distribution of vehicles, and requisitions and orders to purchase. Col. W. H. Noble heads the property division, John Younger the engineering division and Lt.-Col. W. D. Uhler the operating division. George E. Randles, who was formerly with the Foote-Burte Co. of Cleveland and who had charge of maintenance under Christian Girl, is in charge of the maintenance division controlling the advisory and planning, base and field shops, spare parts and accessories, machinery and tools, crating, motor transport depots and the salvage and engineering.

General Drake, Col. Furlow, Lt.-Col. Orton, Lt.-Col. Uhler, Younger and Randles were all associated with the original Motor Section under Gen. C. B. Baker and Christian Girl.

LABOR SHORTAGE REPORT FOR WAR DEPT. NOV.15, 1918.

Your labor needs will be given prompt attention if they are filed at the nearest office of the U.S. Employment Service and if this card is mailed on or before Nov. 15th to Capt. O. Finney, Chief, Industrial Relations Section, Bureau of Aircraft Production, New York District, 380 Madison Ave., N.Y.C. THIS REPORT SHOULD COVER ONLY LABOR SHORTAGE ON AIRCRAFT WORK.

Name of Plant _____ Address _____

Telephone No. _____ At plant ask for _____

OUR IMMEDIATE LABOR NEEDS ARE:

No. Men (White)	Kind of Work	Hours	Rate	Hours Overtime	Rate Overtime

No. Men (Colored) _____
No. Women _____
No. Boys _____
Housing Conditions _____
Cost of Board _____
Remarks _____

If labor is sent to you from other parts of the State, will you (1) Pay transportation; (2) Advance transportation ?

Signature _____

Organization of the Motor Transport Corps

Employment For All Says Frankfurter

WASHINGTON, Nov. 13—That there will be employment for all in this country and that there need be no unemployment, is the opinion of Chairman Felix Frankfurter of the War Labor Policies Board who has given AUTOMOTIVE INDUSTRIES the following statement on this subject:

There is no occasion whatever for any unemployment or misery in this country. There are enough jobs if we carefully make the adjustment that has to be from an energetic war production basis over to the eventual peace basis. With that end in view the Secretary of War, the Secretary of the Navy and Chairman Hurley of the Fleet Corporation, who are the the big production chiefs, met yesterday and at once began the gradual process of adjustment by agreeing to cut out Sunday work and all overtime on Government contracts.

Secretary Baker has also given orders that there should be not curtailment of war work in the War Department, which is of course the biggest war producing agency, except after consultation with representatives of the War Industries Board and the Department of Labor. The point is that before you cut down that releases raw material, the War Industries Board should know where the material is and the Department of Labor, through the Employment Service should be able to take up any labor released so that there should be a minimum of dislocation involved in turning the country over to a peace basis.

Chairman Hurley indicated that the ship industry would go on in this country and would need as many men as they have now. The whole process is to guide the thing with the necessary intelligence and foresight. As to the wage scales there should be no quick changes because that would be an unhealthy process. I think we want to make a gradual healthy adjustment. I think if the interests of labor are adequately represented in working out these things, labor with the rest of the interests of the country will accept what changes that are necessary in going over over to a peace basis.

What labor should have is what the country is entitled to have. That is the change should not be one-sided, but fairly representative of the Government, labor and industry.

I think there will be a gradual shifting of labor over to peace jobs. We are trying through the Community War Labor Boards to find out what the local community needs are. Some labor will be shifting of course, but a great deal of the movement of labor has been in the shipyards and Mr. Hurley's anticipation is that the ship industry will continue at its present actviity.

Overtime and Sunday work will be cut out. These were merely necessities of the war emergency abnormal methods. We must fasten our minds on this. The needs of this country and the needs of the world call for great productivity by the United States of all kinds of goods. If we keep our heads and if we work these things out in a co-operative way, there ought to be very little dislocation.

I cannot speak in detail of the definite plans of the Dapartment of Labor. Its problem arises from the demobilization both of men actually under arms and men in industries whose activity will be terminated by the war.

Highway Traffic Association Now Has National Scope

NEW YORK, Nov. 12—Yesterday's conference of the Highway Traffic Association of the State of New York, at which the subject of snow removal from trunk highways was discussed at length by representative from the North Atlantic and North Central States and from Canada, was followed by the annual meeting.

At this meeting the necessary steps were taken to widen the field of operation and accordingly the association is now one of National scope, with representatives delegated by the various States. The officers were re-elected, as follows:

Honorary president, William P. Eno; president, Arthur H. Blanchard; vice-president, David Beecroft; secretary, Elmer Thompson, and treasurer, George H. Pride.

AUTOMOTIVE MATERIALS MARKETS

Materials Market Prices

Acids:
Muriatic, lb. ..... .02-.03
Phosphoric (85%).. .35-.39
Sulphuric (60), lb.. .006

Aluminum:
Ingot, lb. ..... .33
Sheets (18 gage or more), lb. ..... .40

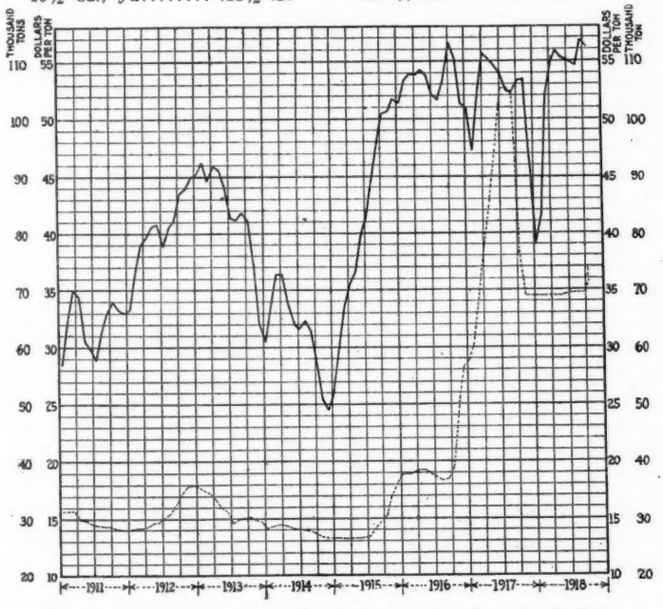
Antimony, lb. ..... .13¾-.13⅞

Burlap:
8 oz., yd..... .17¼-.17½
10½ oz., yd..... .21½-.22

Copper:
Elec., lb. ..... .26
Lake, lb. ..... .26

Fabric, Tire (17¼ oz.):
Sea Is., combed, lb.1.65-1.70
Egypt, combed, lb.1.25-1.35
Egypt, carded, lb.1.20-1.30
Peelers, combed, lb.1.05-1.20
Peelers, carded, lb. .95-1.05

Fibre (⅛ in. sheet base), lb. ..... .50



The full line represents the daily production of pig iron, and the dotted line is the average price per ton of No. 2 Southern at Cincinnati, local No. 2 at Chicago and No. 2X iron at Philadelphia. Reproduced from IRON AGE, *Nov. 7*

Graphite:
Ceylon, lb..... .07½-.25
Madagascar, lb. ... .10 -.15
Mexico, lb. ..... .03¾

Lead, lb. ..... .08 -.09

Leather:
Hides, lb. ..... .18 -.35¼

Nickel, lb. ..... .40

Oil:
Gasoline:
Auto., gal. ..... .24½
68 to 70 gal..... .30½
Lard:
Prime City, gal..2.50
Ex. No. 1, gal....1.70
Linseed, gal. 1.88-1.90
Menhaden (Brown) gal. 1.30-1.31
Petroleum (crude),
Kansas, bbl. 2.25
Pennsylvania, bbl.4.00

Rubber:
Ceylon:
First latex pale crepe, lb. ..... .62
Brown, crepe, thin, clear, lb. ..... .54
Smoked, ribbed sheets, lb. .... .60
Para:
Up River, fine, lb. .66
Up River, coarse, lb. ..... .36½
Island, fine, lb... .55

Shellac (orange), lb. .74 -.76

Spelter ..... .08¾

Steel:
Angle beams and channels, lb. .... .03
Automobile sheet (see sp. table).
Cold rolled, lb..... .06½
Hot rolled, lb..... .03½

Tin ..... .80

Tungsten, lb. 2.45-2.50

Waste (cotton), lb...12¾-.17

AUTOMOBILE SHEET PRICES

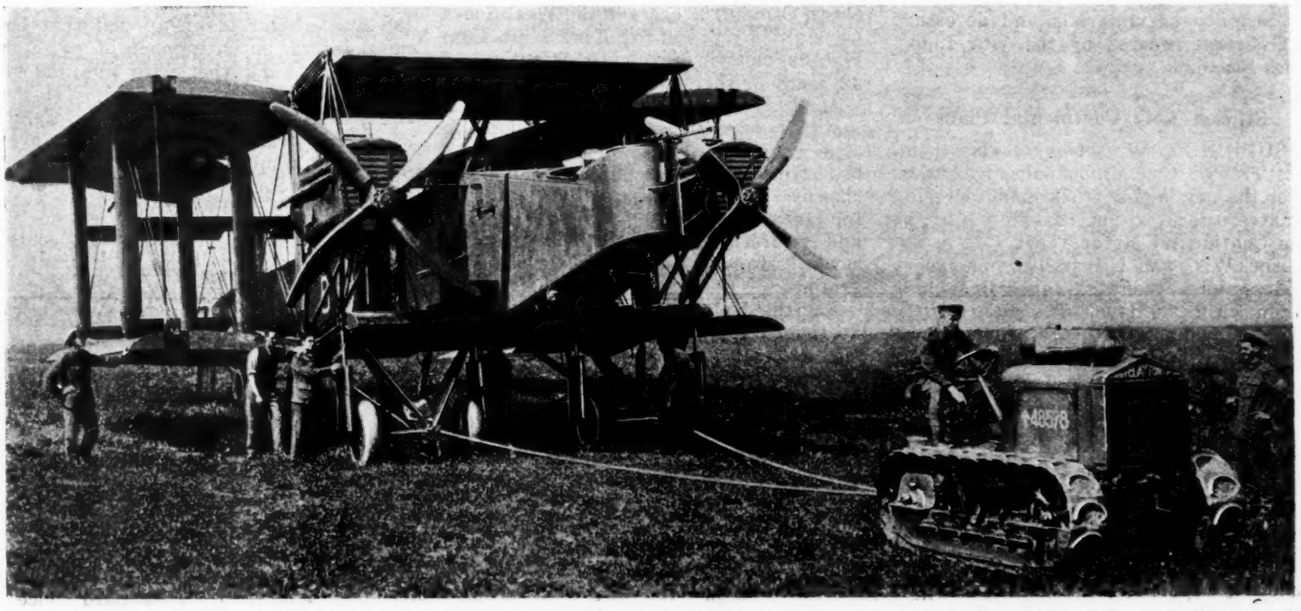
(Based on No. 22 Gage. Other gages at usual differentials)

	Primes only Per 100 lbs.	Primes when seconds up to 15 per cent are taken Per 100 lbs.
Automobile body stock.....	$5.95	$5.85
Automobile body stock, deep stamping	6.20	6.10
Automobile body stock, extra deep stamping	6.45	6.35
Hood, flat fender, door and apron, or splash guard stock.....	6.05	5.95
Crown fender, cowl and radiator casing, extra deep stamping.....	6.55	6.45
Crown fender, cowl and radiator casing, deep stamping.....	6.30	6.20

Automobile Sheet Extras for Extreme Widths:
Nos. 17 and 18 over 36 in. to 44 in., 10c. per 100 lb.
Nos. 19 and 21 over 36 in. to 44 in., 30c. per 100 lb.
Nos. 22 to 24 over 26 in. to 40 in., 40c. per 100 lb.
Nos. 22 to 24 over 40 in. to 44 in., 80c. per 100 lb.

Black Sheet Extras to Apply to Narrow Widths:
Oiling, 10c. per 100 lb.
Patent leveling, 25c. per 100 lb.
Resquaring, 5 per cent of gage price after quality, finish and size extras have been added.

Seconds 10 per cent less than the invoice Pittsburgh price for corresponding primes.



One of the huge British R. A. F. bombing planes with folding wings being towed into position on the flying field by a creeper type tractor

purposes quite impossible, while the painting and numbering will definitely identify every War Department vehicle.

—

Propose Air Mail Route to Texas

WASHINGTON, Nov. 6—A bill has been introduced into the Senate by Senator Sheppard to investigate the cost and practicability of an aerial mail route to Texas and the Southwest. It was referred to the Committee on Post Offices and Post Roads.

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S. A. T. C. Graduates 89,824

WASHINGTON, Nov. 6—The Students' Army Training Corps which has charge of the vocational training of enlisted men and officers for the Army between Oct. 1 and Oct. 28, has graduated 89,824 trained soldiers. Of this number 6341 went into the Motor Transport Corps, 2221 into the Tank Corps and 5729 into the Air Service.

—

Urge Saving of Kerosene

WASHINGTON, Nov. 11—A campaign for the conservation of kerosene and coal oil has been started by the Fuel Administration and directed particularly to farmers, who are asked not to use oil heaters and stoves unless necessary, and who are given instructions in the use of kerosene and oil in lamps, to achieve the highest conservation.

—

More Room For F-W-D

CLINTONVILLE, Wis., Nov. 4—The F-W-D Automobile Co. has virtually taken over the entire plant capacity of the Silent Washer Co. of that city for the period of the war in order to meet the new requirements of Government contracts that until further notice all trucks be shipped in boxes. The Silent Washer Co. manufactures domestic washing machines and is prevented from maintaining production of this product by scarcity of materials and necessary curtailment ordered by the War Industries Board.

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Stinson Gets Continental Plant

SUPERIOR, Wis., Nov. 4—The Stinson Tractor Co., Minneapolis, has taken over the new motor truck manufacturing plant erected for, but never occupied by the Continental Motor Truck Co., in Superior, Wis., and is installing machinery and equipment so that operations may begin within 30 days. The plant will be devoted exclusively to the production of the Stinson tractor.

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Hamilton Making Aircraft Parts

TWO RIVERS, WIS., Nov. 11—The Hamilton Mfg. Co., Two Rivers, Wis., has received additional contracts for aircraft materials and parts for the Government which will keep the plant fully occupied well into next year. The Hamilton company is supplying material for 4000 airplanes to the Dayton Wright Airplane Co., and will complete this contract by Dec. 24.

Trucks Show Saving on Wagon Costs

Official Figures Indicate Enormous Reduction in Operation Cost When Trucks Are Used

WASHINGTON, Nov. 6—Motor truck hauls in 1918 from farm to shipping point averaged 11.3 miles, while wagon hauls averaged 9 miles; and motor trucks made 3.4 round trips daily over the 11.3 mile route while wagons made 1.2 round trips over the 9 mile distance.

The cost of hauling in wagons from farm to shipping point averaged 30 cents per ton a mile for wheat, 33 cents for corn and 48 cents for cotton, while truck or tractor haulage averaged 15 cents for wheat or corn and 18 cents for cotton. These figures are based on reports made by correspondents to the U. S. Department of Agriculture, Bureau of Crop Estimates.

A similar inquiry in 1906 showed an average for wagons of 19 cents per ton-mile for hauling corn or wheat and 27 cents for cotton. This last year naturally found wagon costs higher due to general price increases, but motor trucks show costs lower even than the wagon costs of 1906 due to greater truck efficiency.

The cost of motor truck hauling for wheat varied in different States with 9 cents per ton-mile in 1918 in East North Central, 10 cents in the East South Central, 14 cents in New England, the Middle Atlantic and the West North Central, 15 cents in the West South Central, 17 cents in the Pacific, 18 cents in the South Atlantic and 29 cents in the Rocky Mountain States.

Wagon hauling by States amounted to 22 cents in the Pacific States, 26 cents in the North Central States east of the Mississippi River, 29 cents in the West North Central, 32 cents in the West South Central, 36 cents in the East South Central, 39 cents in the South Atlantic, and 42 cents in the Rocky Mountain States.

Most farmers use smaller sizes of motor trucks, usually the 1 to 2 ton sizes, and in a number of counties these are trucks converted over passenger chassis. In some cases trailers are used for farm produce. In North Dakota and California tractors, each drawing several wagons, are used for hauling grain.

For the United States as a whole the average wagon load of wheat was 55 bushels in 1906 and 56 bushels in 1918 as against the motor truck loads which averaged 84 bushels. For corn the wagon loads of 1906 and 1918 were 38 bushels and the motor truck loads for 1918 amounted to 58 bushels. The cotton load for 1906 and 1918 by wagon was 3.4 and 3.6 bales respectively as against 6.6 bales hauled by motor trucks in 1918.

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Hercules Plant Gets Big War Order

CANTON, Ohio, Nov. 4—A $2,000 000 order for engines to be used in the standard army trucks has been received by the Hercules Motor Co. from the War Department. The company is now engaged solely on government work and has taken over an additional plant to meet its increased space needs.

—

New Hangars To Be Built

WASHINGTON, Nov. 7—Eleven new hangars will be constructed at the Aerial Gunnery School, Miami, Florida, at a cost of $660,000. Three new hangars will be built at North Camp Jackson, to cost $270,110.

—

Allies Get 72 Per Cent of Petroleum Products Exports

WASHINGTON, Nov. 12—During the month of September the exports of petroleum products to England, France and Italy aggregated 45,509,122 gal. valued at $7,639,191. Details of the exports to each of these countries are given in the following table:

	England	France	Italy
Fuel oil, gal..	12,882,558	537,749	474,686
Illuminating oil, gal.....	7,674,320	4,805,761	.....
Lubricating oil, gal.....	6,231,046	1,468,490	1,366,990
Gasoline, gal..	4,357,588	2,079,863	.....
Other naphthas, gal.	2,619,458	.....	1,010,613
	33,764,970	8,891,863	2,852,289
Total value.	$5,383,830	$1,418,547	$836,814

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Massachusetts Considers Legislation

BOSTON, Nov. 9—At a meeting here Thursday at the State House representatives of the automobile industry, owners of trucks and cars, and accessory men discussed with a committee comprising the Highway Commission, and other State officers the problems of motor legislation. The last legislature passed a resolve calling for an investigation by the Highway Commission, and Secretary of State A. P. Langtry and Thomas W. White of the Administration Board. The subject of increased fees on trucks was the first matter taken up, but that had no sponsors, but a number of objectors who pointed out that with five and six taxes next year increased fees by Massachusetts would not be fair. The weight of loads was thoroughly talked over, whether it would be possible to limit vehicles to a total of 10 tons including the weight of the vehicle; or the use of two smaller vehicles instead of one large machine, etc. The opinion seemed to be that the 14-ton limit now was pretty nearly right for here. The length and width of body were other topics, as were headlights, the controlling of jitneys, the probability of trailers and tractors coming into general use, etc. A committee was appointed to consider a suggestion made by John H. Johnson of the N. A. D. A. that the dealers be divided into three classes, Class A the men who handle cars and trucks as factory representatives and their sub-dealers; Class B those handling used cars solely, and Class C the men who junk cars. It was brought out that many people have dealer licenses who are not entitled to them, and so they will be curtailed next year.

150,955 Tractors in 2½ Years

During the First Six Months of 1918, 58,543 Were Manufactured

WASHINGTON, Nov. 11 — Eleven thousand three hundred and eighty-eight tractors were in the hands of manufacturers, in transit or in the hands of dealers in August, 1918, according to a report just filed by the office of farm equipment, United States Department of Agriculture, following an investigation of the tractor situation in this country.

Investigation was for the purpose of securing accurate information to facilitate adequate and equitable distribution of farm tractors throughout the country. In connection with the inquiry a report was received from every tractor maker in the country concerning tractors manufactured and their distribution between Jan. 1, 1916, and July 1, 1918. Following is the summary of the compilation of the replies:

NUMBER OF TRACTORS MANUFACTURED

1916	29,670
1917	62,742
January 1 to June 30, 1918	58,543
Total for 1916, 1917 and first half of 1918	150,955

NUMBER OF TRACTORS SOLD

To Users

1916	27,819
1917	49,504

To Exporters

1917	14,854
1918, first 6 months	15,610
Number of tractors on hand, in transit or in hands of dealers at time of report (August, 1918)	11,388

—

Restrain Milwaukee Tank

WASHINGTON, Nov. 7—The Federal Trade Commission to-day ordered the Milwaukee Tank Co., Milwaukee, makers of automatic measuring oil pumps, tanks and devices for the storage and handling of gasoline and other volatile liquids, to discontinue "divers means and methods of inducing and procuring a large number of its customers and prospective customers and the customers and prospective customers of its competitors to cancel and rescind orders and contracts for the purchase of pumps, tanks and outfits placed with said competitors." The concern agreed to issuance of the Commission's order waiving right to introduce testimony in support of its practices.

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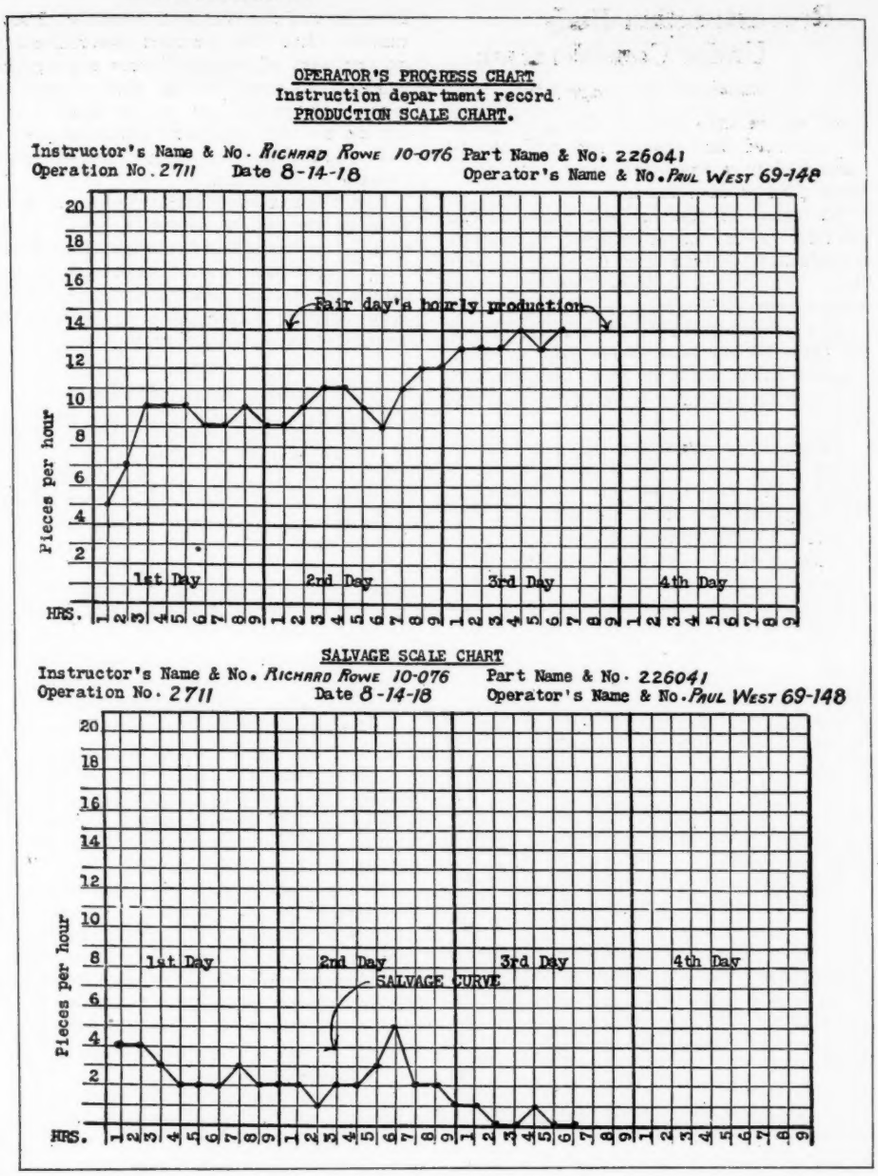
Westinghouse to Close Indianapolis Office

INDIANAPOLIS, Nov. 4—The Westinghouse Electric & Mfg. Co. will close its local office on Dec. 1 for the period of the war. The business of the territory hitherto handled from Indianapolis will be dealt with at the Chicago office, Conway Building. Prescott C. Ritchie, now in charge at Indianapolis, will manage the Chicago office.


OPERATOR'S PROGRESS CHART
Instruction department record
PRODUCTION SCALE CHART.
Instructor's Name & No. Richard Rowe 10-076 Part Name & No. 226041
Operation No. 2711 Date 8-14-18 Operator's Name & No. Paul West 69-148
Pair day's hourly production
Pieces per hour
1st Day
2nd Day
3rd Day
4th Day
HRS.
SALVAGE SCALE CHART
Instructor's Name & No. Richard Rowe 10-076 Part Name & No. 226041
Operation No. 2711 Date 8-14-18 Operator's Name & No. Paul West 69-148
SALVAGE CURVE
Pieces per hour
1st Day
2nd Day
3rd Day
4th Day
HRS.

THE chief instructor of the training department of a large manufacturing concern engaged upon aircraft production has forwarded to the Training and Dilution Service Department of Labor actual sample copies of their "operator's progress charts." These charts are of unusual interest because they visualize so clearly the value of training unskilled workers. They are reproduced herewith for the benefit of other manufacturers.

A glance at the Production Scale Chart will readily show that in the first hour this unskilled worker was able to turn out 5 pieces of repetition work. But the Salvage Scale Chart registers 4 spoiled parts against him, hence his net production for the first hour was but one part. At the end of his second hour's work his production had increased to seven parts, yet his salvage remained at the same rate as that of the first hour's work. Had he been allowed to continue in the old method of "breaking in," having to work out his own salvation in a sink-or-swim fashion, his salvage would no doubt have remained at the same rate for many days or even weeks to come.

But under the careful guidance of a trained instructor who was there to point out his errors as each part progressed, he was able in the third hour to increase his production to 10 parts and at the same time decrease his salvage to 3. The record of the third hour was maintained during the fourth and fifth, yet his salvage decreased to 2 parts.

The beginning of the second day found him turning out 7 times greater net production than at the start of his first day. And though his salvage fluctuated with his production during this day, his last hour's work showed a greater net production than at any previous time. On the third day his first hour's production was 12 parts with a minimum salvage of 1, the end of the second hour he had raised his production to 13 and entirely eliminated his salvage. By night of the third day's work he had reached a high level of production, viz., 14, with no salvages against him.

The cold facts disclosed in these outline charts show conclusively what can be accomplished by training unskilled and inexperienced workers. The Training and Dilution Service offers the assistance of its experts who will be glad to consult with manufacturers regarding standardized training methods.

Reconstruction Body Under Consideration

(*Continued from page* 848)

uted where they will do the most good. It is stated that war orders will not be cancelled in a wholesale way until some such plan is developed.

So much for the national phase of the matter. Local manufacturers in various population centers are on the anxious seat. This week in New York a conference of employers, representing 2,000,000 war workers, was held to consider means of transferring labor from war work to peace work without any considerable break in the earning time of the individual.

Plans were considered for switching labor from war work to peace work as rapidly as war industries reduce their working forces. In consequence of the meeting a committee was appointed, with a representative for each industry. This committee will present to the United States Employment Service, from time to time, the actual needs of employers of labor. In this way this government bureau will operate in the most effective manner as a clearing house. The bureau is sending out a questionnaire to manufacturers with the idea of obtaining accurate data on labor requirements and with the idea that such requirements may be filled by releasing war workers for industries connected with more peaceable purposes.

The National Association of Manufacturers has taken a step which should go far to relieve worry on the part of returning soldiers. President Stephen C. Mason has announced that all returned soldiers will have their jobs restored to them in all factories of members of the association. The announcement is to be cabled to General Pershing. It is the plan to have an open door for a return to duty and prosperity for every American soldier and sailor.

The policy of the Government with regard to the release of labor is made plain by its action in gradually closing down the gas defense plant of the United States Government in Long Island City. Here there are 12,000 men and women employed. Following a conference yesterday, notices were posted of a gradual reduction of the working force instead of a wholesale discharge, and government agencies are actively engaged in finding positions for workers as rapidly as they are released.

The question of wages is one of paramount importance. It is suggested that with the cessation of hostilities the needs of war will no longer supply work nor determine the labor relationship. In view of these facts it is thought impossible that the present 8-hour day will survive, or that the era of high wages will continue very much longer.

The sentiment is that the gains obtained by organized labor must be gradually relinquished and that a return to pre-war conditions, both insofar as concerns the hours of work and the wage scale, will follow as a matter of course. It is the opinion of William H. Barr, President of the National Founders Association, that "the present determination on the part of certain forces among the workers to cling to all that organized labor has gained on an unsound basis during an abnormal and artificial period will doubtless occasion considerable trouble and friction."

But, regardless of whatever machinery may be created to supervise the transition, it is considered certain in official circles that the Government will maintain a centralized control and exercise a very positive supervision over business interests during the change.

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Consider Steel Situation

WASHINGTON, Nov. 13—Conferences are being held here between the War Industries Board and the American Iron and Steel Institute Committee, headed by E. H. Gary to determine what steel can be allocated to non-war industries. No definite decisions were arrived at other than that the War Industries Board will continue to control the allocation of steel for the time being. Data are being gathered and further meetings will then be held to determine how soon Government control of steel can be abolished.

Arrangements have been made to provide the additional steel required by these non-war industries following the modification of the curtailments but no announcement of how this will be accomplished has been made or will be given out at this time.

Arrangements have been made by the War Department to care for those contractors whose contracts have no termination clauses and whose war-work will probably be cancelled. In each instance the contractor will be asked to sell the raw materials on hand and their cost plus handling charges plus overhead directly applicable; the partly finished products on hand and their cost of raw material and labor plus overhead directly applicable, finished products on hand and the contract price less freight charges if contract specifies delivery at point other than factory; special facilities including their cost as paid for and their cost as estimated in the contractors original estimate.

The fair value at the time the contract is terminated will be deducted from the original cost and the contractor is asked to thus determine the ratio of the uncompleted portion of the whole contract; the contractor will also determine the costs of committments to suppliers and subcontractors in the same manner as in the above rules.

If the contractor claims additional compensation he is to include it with the original claim with detailed facts. If a contract is cancelled the Government official loses his power to enter into a supplemental contract with the contractor.

No allowances will be made for prospective profits but an allowance may be had of 10 per cent of the cost on partly finished products. All materials partly finished products and finished products become the property of the Government if an agreement is reached.

Washington S. A. E. Section Formed

(*Continued from page* 848)

Rear Admiral G. W. Taylor, Chief of Construction, U. S. Navy, told of airplane development in the Navy, praising the Liberty engine highly, and said that if it had been a failure the entire Navy program would have failed. The Navy now patrols more than 100,000 miles of coast by airplane weekly and is using single, twin and triple-engine planes and lighter than air dirigibles equipped with single and double engines. The dirigibles make 60 m.p.h. The Curtiss Engineering Co., said the Admiral, has lately developed a seaplane engine that has developed 160 m.p.h. The seaplanes using triple engines are as large as the Handley-Page airplanes.

The Admiral was very enthusiastic over the development of a Washington section and certain it would accomplish much good. Lt.-Col. Edward Orton Junior spoke for the Motor Transport Corps, praising the standardized truck developed by the Society of Automotive Engineers and designed, produced, assembled and operated within 75 days, and which he said was the best truck ever built. He said the Government had already had great benefits from the S. A. E. and would certainly receive additional valuable aid if a section were established. Rear Admiral C. W. Dicer, Chief of the Bureau of Steam Engineering, in charge of engines, told that the Navy uses the Curtiss Liberty, and Hispano-Suiza engines in its program, and that in 2 years the engines have improved from 90 m.p.h. to 160 m.p.h. He stated that the Eagle boats have been made noiseless by use of new drives that eliminate vibration, noisy gears, and at 18 knots keep the engine room silent, which is necessary, as these boats were designed to listen while running and to attack submerged submarines.

Lt.-Col. W. G. Wall, Ordnance Department, formerly National chief engineer, displayed photographs and motion pictures to illustrate the work of the Ordnance Department and showed trench mortar hauling trucks, reconnaissance cars, field gun trailers, caterpillar trailers for carrying ammunition, 10-ton tactors to haul large guns with drawbar pull of 10,000 lb. and speed of 6 m.p.h.; 5-ton tractor with drawbar pull of 6000 lb. and speed of 10 m.p.h.; 3-ton tank equipped with two Ford engines, of which many have been made; 6-ton tank similar to the French Renault tested on 100 per cent grade, stopped halfway and started again, and capable of going most anywhere.

He told how the American Army learned to use tractors not only to haul guns but to carry them and shoot them while on tractors. This, he said, made it difficult for the enemy to get the range as the guns could be moved easily and quickly, and further this eliminated the need for digging the gun into the ground, the usual camouflage and the carrying away of dirt to prevent enemy airplanes finding the guns.

Men of the Industry

Changes in Personnel and Position

Ward M. Canaday, advertising manager of the Willys-Overland Co., Toledo, Ohio, is giving part of his time at Washington directing the public information work of the Non-War Construction Division of the War Industries Board, headed by D. R. McLennan of Chicago.

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Earl L. Woods, sales manager of the tractor department of the J. I. Case Plow Co., Racine, Wis., has accepted a commission as a captain in the Motor Transport Corps and will go overseas shortly with Unit 304, to which he reported for duty at Ft. Sam Houston, Tex., on Nov. 10.

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Albert Gough is now in charge of the service department of the Liberty Motor Car Co., Detroit. He was formerly connected with the Shaw Electric Crane Co., Muskegon, where he was engaged in production work, and more recently with the service organization of the Chalmers company.

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James W. Graham, member of the C. A. S. Engineering Co., Columbus, Ohio, the steering gear manufacturing company of the parent organization in Detroit, died at Columbus of influenza. He was purchasing agent of the old Krit company.

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Howard West, purchasing agent for factory supplies at Dodge Brothers, Detroit, died of Spanish influenza at his home in Royal Oak, Nov. 2.

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Walter E. Parker, president of the Commerce Motor Car Co., Detroit, has entered the service in the capacity of captain in the Quartermaster's Corps, and is chief of the motor transport division in Indiana and Michigan.

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Mott Completes Organization

DETROIT, Nov. 8—Major C. S. Mott, head of the Weston-Mott Co., Flint, and in charge of the inspection and production branch, Motors and Vehicle Division, Quartermaster Corps, this district, has completed his staff organization. Among the members of his staff are Lieutenant Harold Whitmore, former production superintendent of the Dort Motor Car Co., Flint, in charge of Class AA truck production; Charles H. Quirk, production manager for the Buick Motor Co. and later with the Cadillac company on Liberty engines, who will have charge of the quad and four-wheel drive section.

Earnest Kollmorgan, former superintendent of the W. A. Paterson Co., Flint, will have charge of the production of Ford, Dodge, Cadillac and Packard cars for the Army; Harold Comlossy, of MacCrone & Co., accessory dealer in Chicago, to have charge of spare parts; Lieutenant Neil J. Bersten, formerly with the Weston-Mott Co., Flint, to have charge of the Continental Motors and Hinkley Motors Co. production of engines; Lieutenant Lloyd Kenworthy, formerly with the Weston-Mott Co., to have charge of production of Timken axles; Lieutenant Vance Day, formerly with the General Motors Truck Co., to have charge of production of trailers.

Harvey J. Mallery, formerly with the Weston-Mott Co., will have charge of accounting; A. P. Brush, Brush Engineering Association, Detroit, production engineer of the motors branch; Herbert White, formerly with the Hyatt Roller Bearing Co., Detroit office, appointed assistant to Major C. S. Mott; Captain W. B. Deyo, former Ford dealer, member of the production department of the motors division; Benjamin Rosenszweig, former purchasing agent of the Buick Motor Co., Flint, to have charge of priorities; F. H. Mutchler, accountant, to have charge of statistics.

Lieutenant E. C. Welch, Port Huron, will have charge of production of Class B trucks; R. E. Winans, assistant in charge of production of Class B trucks; Bernard McKay and Henry Hellman, both with the Ford Motor Co., assistants to E. C. Welch; F. P. McDevitt, also assistant to E. C. Welch; Arthur Hayes, formerly with the Ford Motor Co., gray iron specialist; Lieutenant W. O. Lamke, assistant in charge of priorities; Lieutenant R. P. Kenney, assistant to E. C. Welch; H. Coen, formerly of the Ford Motor Co., assistant in charge of the production of quad and four-wheel trucks.

J. F. Gilmore will be assistant in charge of spare parts; C. A. Bundy, assistant in charge of spare parts and located at the plant of the Packard company; H. P. Glazier, assistant, same duties, assigned to the plants of the Ford and Cadillac companies; W. W. Carpenter, assistant, in like capacity, assigned to the Dodge plant; L. F. Mullen, Detroit, assistant, same duties, and John F. Thompson, Federal motor truck distributer, Detroit, in charge of body division.

Major George D. Wilcox, former sales manager of the Commerce Motor Car Co., Detroit, is Detroit district manager of the motors branch, and Norval A. Hawkins, sales manager of the Ford Motor Co., his assistant. Captain W. E. Parker, president of the Commerce Motor Car Co., Detroit, is traffic chief of the division, covering Michigan and Indiana.

James W. Graham

COLUMBUS, OHIO, Nov. 11—James W. Graham, president of the C. A. S. Products Co., manufacturer of auto gears and other parts and accessories, died at his late residence last week from an attack of influenza. He was 29 years of age and reorganized the present company from the old Foster Gear Co. about three years ago. His former home was at Carthage, Canada.

Guy Nonemacher, formerly secretary to President Walter P. Chrysler, of the Buick Motor Co., Flint, who has been color sergeant with the 125th Infantry in France, has been promoted to second lieutenant.

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L. E. Trent has been appointed secretary and general manager of the Common Sense Gas Tractor Co., Minneapolis. He succeeds H. W. Adams.

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E. L. Evans has been appointed superintendent of Plant 1 of the Bound Brook Oil-Less Bearing Co., Bound Brook, N. J. He was formerly chief inspector of the plant.

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Western Trailer Adds to Personnel

KANSAS CITY, Nov. 11—The Western Trailer Co., organized in April, 1918, has for the third time increased its factory, the latest addition being 50 x 175, two stories. The body factory, paint shop and other enterprises will occupy the older portions of the building, about twice the size of the new. The company has recently engaged H. M. Gillespie, formerly district sales manager of the Republic Motor Truck Co., with headquarters in New York, as assistant to the president and director of sales. Mr. Gillespie was also formerly connected with the White Co., and was assistant manager of the Racine Saddlery Co. H. G. Fluerity, for several years chief engineer of steel mills in the Pittsburgh and Birmingham districts, has been engaged as chief engineer of the Western Trailer Co., and is now completing designs for trailers which the company manufactures, from one-half to twelve tons capacity. Peter Nelson, formerly in charge of body building departments for passenger car and truck manufacturers, incl ding Packard, Nash, Mack and General Motors, has been employed as superintendent of the body building department; he will specialize in bodies of intricate design with which the trailers will be equipped. C. J. Welch is president and general manager of the Western Trailer Co.

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Government to Retain Control of Steel Prices

WASHINGTON, Nov. 13—In accordance with the expressed wishes of steel producers at the first Reconstruction Conference of the War Industries Board held to-day, the Government will continue for the time being the regulation of the sale and distribution of steel.

It was felt that this course was desirable in order to insure against the possibility of disturbance to the steel industry or to other industries in which steel plays an important part. An informal statement was ssued jointly after the meeting of the chairmen of the War Industries Board and of the American Iron and Steel Institute. This was to the effect that the general discussion had the main purpose of preserving industrial stability, and that it was characterized by a spirit of co-operation and that further data and information would be collected for the use of further conferences.

New Quartermaster Contracts

WASHINGTON, Nov. 11—The following contracts were placed by the Quartermaster Board of Review:

United States Rubber Co., Dallas, raincoats, $6,761.63.
United States Rubber Co., Boston, raincoats, $5,826.09.
Firestone Tire & Rubber Co., Akron, tubes and casings, $14,028.14.
Firestone Tire & Rubber Co., Akron, tubes and casings, $6,970.40.
B. F. Goodrich Co., Akron, tubes, $6,112.75.
B. F. Goodrich Co., Akron, tubes and casings, $11,327.04.
United Equipment Corp., New York, tool bags, $5,900.
White Co., Cleveland, wheels, etc., $35,781.60.
Berg Auto Truck & Specialty Co., New York, shoeing boxes, $13,035.
U. S. Rubber Co., Baltimore, raincoats, $7,034.75.
B. F. Goodrich Rubber Co., Akron, tires, $6,203.75.
H. S. Tire & Rubber Co., New York, casings, $13,041.50.
B. F. Goodrich Co., Akron, casings, $14,483.
Dort Motor Car Co., Flint, cargo bodies and troop seats, $132,500.
Field Mfg. Co., Owosso, Mich., cargo bodies and troop seats, $71,500.
International Harvester Co., Chicago, cargo bodies and troop seats, $286,000.
Auto Body Co., Lansing, cargo bodies and troop seats, $341,250.
Belber Trunk Co., Philadelphia, tool bags, $46,104.96.

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Indian Service Wants Cars

WASHINGTON, Nov. 7—Bids are asked for three 5-passenger touring cars to be delivered by December 1, by the United States Indian Service, Department of the Interior, Yakima Agency, Fort Simcoe, Washington. Bids are to be filed by November 20 and the bidder should state the make of the automobile he proposes to furnish and also quote the price f.o.b. White Swan, Washington on the Northern Pacific Railroad.

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Ordnance Department Contracts

WASHINGTON, Nov. 4—The following contracts and purchases were made by the Ordnance Department:

Vim Motor Co., Sandusky, lifting plugs.
Maxwell Motor Co., Detroit, tools and accessories.
Cleveland Tractor Co., Cleveland, tractors.
Four-Wheel Drive Auto Co., Clintonville, parts.
Detroit Auto Specialty Co., Detroit, fuse socket holders.
Edw. G. Budd Mfg. Co., Philadelphia, airplane release mechanism, bomb release mechanism, crates.
Nash Motors Co., Kenosha, truck repair parts.
B. F. Goodrich Rubber Co., Akron, rubber hose.
Allen Motor Co., Fostoria, safety bolts and gun spare parts.
Billings & Spencer Co., Hartford, wrenches.
Pan Motor Co., St. Cloud, drop forgings.
Keystone Forging Co., Northumberland, Pa., drop forgings.
Nash Motors Co., Kenosha, automobiles.
Willard Storage Battery Co., Cleveland, batteries.
Parson Lumber & Mfg. Co., Bridgewater, Nova Scotia, spruce.
Charles T. White & Son, Sussex, New Brunswick, spruce.
Fellows & Co., Boston, spruce.
Lake Niegantic Pulp Co., Lake Niegantic, Quebec, Canada; spruce.
American Commercial Car Co., Detroit, motor trucks.
Cadillac Motor Car Co., Detroit, ambulances.
Ford Motor Co., Detroit, ambulances.
Wright-Martin Corp., New Brunswick, services.
Wright-Martin Corp., New Brunswick, labor.
Ward Motor Vehicle Co., Philadelphia, trench searchlights.

Contracts

General Engineer Contracts

WASHINGTON, Nov. 4—The following contracts were made by the General Engineer Depot:
Ford Motor Co., Detroit, wheels.

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Marine Corps Contracts

WASHINGTON, Nov. 4—The following contracts have been placed by the Marine Corps:
Nash Motors Co., Kenosha, spare parts for trucks.

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Aircraft Production Purchases

WASHINGTON, Nov. 4—Following is a list of purchases made by the Aircraft Production Board:

2250-2. Wright-Martin Aircraft Corp., New Brunswick, engine spares.
International Stamping Co., Detroit, spares for planes.
The Bristol Co., Waterbury, Venturi Pitet tubes.
Curtiss Aeroplane & Motor Co., Buffalo, spares for planes.
Willys-Overland Co., Toledo, motors and spares.
Curtiss Aeroplane & Motor Corp., Buffalo, engine spares.
Curtiss Aeroplane & Motor Corp., Buffalo, spares for planes.
Capital Electric Co., Washington, D. C., material for mobile electric plants.
Standard Seamless Tube Co., Ambridge, Pa., tubing.
Tillotson Mfg. Co., Toledo, O., carbureters.
Curtiss Aeroplane & Motor Corp., Buffalo, planes.
Curtiss Aeroplane & Motor Corp., Buffalo, engine spares.
Wright-Martin Aircraft Corp., New Brunswick, tools for engines.
Wright-Martin Aircraft Corp., New Brunswick, engine spares.
Standard Parts Co., Cleveland, Ohio, tubing.
Standard Varnish Works, 90 West Street, New York, for mixing of dope.
Standard Aero Corp. of New York, Elizabeth, N. J., planes.
The Steel Products Co., Cleveland, Ohio, engine spares.
Curtiss Aeroplane & Motor Corp., Buffalo, engine spares.

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New Milwaukee Ford Home

MILWAUKEE, Nov. 11—The Milwaukee branch of the Ford Motor Co., which turned over its big assembling plant to the Government for hospital purposes on Nov. 1, has taken over the three-story building of the Hughes Motor Car Co. for the period of the war and one year thereafter.

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Calendar

ENGINEERING

Nov. 14-15—New York. Society of Naval Architects and Marine Engineers. Twenty-sixth general meeting. Engineering Societies Bldg., 29 West 39th Street.

SHOWS

Nov. 11-16—Phoenix, Ariz. Tractor demonstration, State Fair.
Nov. 11-16—Pittsburgh, Pa. Fall Automobile Show. Motor Square Garden. Automobile Association of Pittsburgh.
Jan. 13-19—Des Moines, Ia. First Tractor Show. Des Moines Thresher & Tractor Club. H. J. Clark, Mgr.

Aircraft Production Contracts

WASHINGTON, Nov. 8—Following is a list of contracts placed by the Bureau of Aircraft Production:

General Motors Corp., Detroit, motors.
Dartmouth Mfg. Co., New Bedford,, Mass., airplane fabric.
William Whitman & Co., New Bedford, Mass., airplane fabric.
American Bleached Goods Co., Taftville, Conn., airplane fabric.
Harding, Tilton & Co., New Bedford, Mass., airplane fabric.
Harding, Tilton & Co., New Bedford, Mass., airplane fabric.
Unit Construction Co., Philadelphia, Pa., propellers.
Marlin-Rockwell Corp., New York, spares for planes.
Hardman, Peck & Co., New York, propellers.
The Holbrook Co., New York, propellers.
Packard Piano Co., Fort Wayne, Ind., propellers.
The Unit Construction Co., Philadelph a, Pa., generator propellers.
Intertype Corp., Brooklyn, N. Y., interrupter gears.
Wolverine Brass Works, Grand Rapids, Mich., interrupter gears.
Wright-Martin Aircraft Corp., New Brunswick, engine spares.
Holt Mfg. Co., Peoria, Ill., adapter sets.
Thomas-Morse Aircraft Corp., Ithaca, spares for planes.
Thomas-Morse Aircraft Corp., Ithaca, spares for planes.
Hardman, Peck & Co., New York, lamination sets.
Curtiss Aeroplane & Motor Corp., Buffalo, spares for planes.
Curtiss Aeroplane & Motor Corp., Buffalo, airplanes.
Thomas-Morse Aircraft Corp., Ithaca, spares for planes.
Olds Motor Co., Lansing, Mich., engine spares.
Splitdorf Electrical Co., Newark, engine spares.

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Beaver Kerosene Tractor Engines

(*Continued from page* 839)

the crankpin bearings. Each of the connecting-rod heads is provided with a splash scoop which dips into an oil trough beneath the crank, and splashes oil all over the interior surface of the crankcase and on to the cylinder wall. Oil holes are provided on top of all bearings through which oil from the splash can find its way to the bearing surfaces.

For circulating the cooling water there is provided a centrifugal pump with 5 in. impeller. This pump runs at crankshaft speed and tests have shown that at 900 r.p.m., at which speed the engine is governed, it delivers about 190 lb. of water per minute against a head of 1½ ft. A 20-in. fan is usually employed with these engines and is driven by a 1¾ in. flat belt from the accessories shaft.

The weight of either size of engine is in the neighborhood of 1000 lb. A governor is always fitted. In the past various makes of governors have been used by different customers, but the company is now developing one of its own design.

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Kansas City Wants Fire Trucks

KANSAS CITY, Nov. 11—As the result of the adoption of prefects for issuing bonds in Kansas City, Mo., at the election Nov. 5, the city will shortly be in the market for more than $100,000 worth of fire department motor equipment, and may within a year be buying motor equipment for the delivery of ice from a municipal plant. One bond issue is for $200,000 to buy fire department equipment, the purpose being to replace nearly all the present vehicles.